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ABSTRACT

This book reports on the 1994 National Assessment for Educational Progress (NAEP) assessment in geography for grades 4, 8, and 12. Students performance is summarized on a scale ranging from 0 to 500 with the achievement levels of Basic, Proficient and Advanced for each grade. Major findings for the nation include: (1) The Proficient level was reached by 22 percent of fourth graders, 28 percent of eighth graders, and 27 percent of twelfth graders; (2) At each grade level, roughly 70 percent of students were at or above the Basic level; (3) As students' geography scores increased, the complexity and sophistication of the geographic knowledge and skills they exhibited increased; and (4) Generally, students across grades in the higher percentiles exhibited greater abilities to work with a range of geographic tools, create maps based on tabular or narrative data, grasp processes and relationships, bring outside knowledge to bear on answering questions and analyze data. The book contains five chapters. Chapter 1, "NAEP 1994 Assessment in Geography," presents the overview of the NAEP 1994 geography assessment, including its content framework, design, and administration, along with sample questions and student responses from the assessment. Chapter 2, "Geography Results For the Nation and Regions," provides overall average scale score results for the nation, regions, and subgroups of students. Chapter 3, "Geography Achievement Levels," describes student performance in terms of achievement levels. Chapter 4, "Contexts in Which Students Learn Geography," describes contextual factors related to students' geography achievement. Chapter 5, "What Students Know and Can Do in Geography," describes the specific abilities that students demonstrated on the NAEP 1994 geography assessment and reports student performance in different content areas of geography. Three appendices and extensive tables and figures accompany the text. (EH)

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THE NATION'S REPORT CARD naep

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In 1988, Congress established the National Assessment Governing Board (NAGB) to formulate policy guidelines for NAEP. The Board is responsible for selecting the subject areas to be assessed from among those included in the National Education Goals; for setting appropriate student performance levels; for developing assessment objectives and test specifications through a national consensus approach; for designing the assessment methodology; for developing guidelines for reporting and disseminating NAEP results; for developing standards and procedures for interstate, regional, and national comparisons; for determining the appropriateness of test items and ensuring they are free from bias; and for taking actions to improve the form and use of the National Assessment.

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NAEP 1994 Geography Report Card

Findings from the National Assessment of Educational Progress

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EXECUTIVE SUMMARY

If policymakers, educators, and concerned citizens are to reform and improve the United States educational system, they need valid and reliable information on the strengths and weaknesses of American students and on the instructional factors that are related to differing levels of performance. For more than 25 years, the National Assessment of Educational Progress (NAEP) has provided such information. NAEP assessments have probed students' abilities in a variety of subject areas, reporting both on what students know and can do and on the relationships between instructional, institutional, and background variables and differing levels of educational achievement. As the nation's foremost ongoing education survey, the national assessment data track trends in student performance and allow concerned readers to evaluate whether America's students have the skills and knowledge necessary to participate in today's economic and political worlds.

In 1994 NAEP conducted national assessments in reading, geography, and United States history at grades 4, 8, and 12. The geography results included in this *Report Card* describe students' achievement at each grade and within subgroups of the general population. In addition, the report discusses the relationships among student performance and instructional and home background variables. Taken together, this information will give educators a context for evaluating the geography achievement of students and data that may be used to guide reform efforts.

Student performance on the NAEP 1994 geography assessment is summarized on the NAEP geography scale, which ranges from 0 to 500. The geography scale allows for the discussion of what students *know and can do* in terms of the geography content covered by the assessment. In addition, results are reported according to geography achievement levels adopted by the National Assessment Governing Board. For each grade, three achievement levels were set — *Basic, Proficient,* and *Advanced.* These are based on judgments, made by broadly representative panels, about what students *should know and should be able to do* in geography.

The *Proficient* achievement level represents solid academic performance that demonstrates competency over challenging subject matter for each grade assessed. The *Basic* achievement level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work. The *Advanced* achievement level signifies superior performance.

To maximize usefulness to policymakers, educators, parents, and other interested parties, the NAEP results are presented both as average scores on the NAEP geography scale, and in terms of the percentage of students attaining NAEP geography achievement levels. Thus, NAEP results not only provide information about what students *know and can do*, but also indicate whether their achievement meets expectations of what students *should know and should be able to do*. Furthermore, the descriptions of skills and abilities expected of students at each achievement level help make the reporting of assessment results more meaningful.

Major Findings for the Nation

- The *Proficient* achievement level was reached by 22 percent of fourth graders, 28 percent of eighth graders, and 27 percent of twelfth graders.
- At each grade, roughly 70 percent of students were at or above the *Basic* level.
- As students' geography scores increased, the complexity and sophistication of the geographic knowledge and skills they exhibited increased. For example:
    - At grade 4, 79 percent of students could identify the water cycle from an illustration; 70 percent could draw a generally accurate map of an island from a written description; 59 percent could use a map to explain the concentration of highways in the eastern United States; and 13 percent could describe two important effects of an oil spill in the ocean.
    - At grade 8, 90 percent of students knew where to locate information in an atlas; 70 percent could understand why immigrants congregate in New York City; 48 percent could identify latitude on a polar map projection; and 36 percent could identify and explain two reasons why a particular route for a railroad would prove cheaper to construct than an alternate route.
    - At grade 12, 91 percent of students could use a map to identify an area of earthquake activity; 66 percent could construct a precipitation pie chart from tabled data; 55 percent could give at least two geographically accurate reasons that a shopping center should be placed at a given location; and 10 percent could identify Canada as the United States' largest trading partner.

- Generally, students across grades in the higher percentiles exhibited greater abilities to work with a range of geographic tools, create maps based on tabular or narrative data, grasp processes and relationships, bring outside knowledge to bear on answering questions, and analyze data.

Major Findings for Student Subgroups

- As in other NAEP assessments, statistically significant differences existed in the performance of major subgroups of the population. For example, at all three grades, White and Asian students had higher scores than did their Black and Hispanic counterparts. In addition, at all grades, Hispanic students had higher average scale scores than did Black students.

- Consistent with findings in other assessments, there was a strong relationship between differing levels of parental education and performance in geography. As a general rule, the more education students' parents had received, the better they performed on the assessment.

- On the overall geography scale, male students performed better than female students at all three grades. However, gender differences were not consistent across content areas within geography. For example, at grade 4 males outperformed females on tasks assessing the content area "Space and Place," while there were no significant performance differences in the two other content areas.

- At all three grades, students attending nonpublic schools performed at a higher level than did those attending public schools.

Contextual Factors Related to Geography Performance

A diverse range of home and school factors are related to the ways and extent to which students learn geography. Students who participated in the NAEP assessment were asked to complete questionnaires about home and school experiences related to geography learning. Also, teachers and school administrators completed questionnaires about their students' instructional experiences. The results of these surveys help place the assessment scores into context, and allow policymakers to determine which variables are positively and negatively related to geography achievement.

- Over 40 percent of the students at grades 4 and 8, and 25 percent of the students at grade 12 reported watching four or more hours of television each day. In most cases, the more television students reported watching, the worse they performed on the geography assessment.

- Fifty-six percent of fourth graders, 39 percent of eighth graders, and 31 percent of twelfth graders reported discussing their studies at home daily. By contrast, 17, 21, and 24 percent of students at grades 4, 8, and 12, respectively, reported never or hardly ever discussing their studies at home. Students who reported not discussing their studies at home performed at a lower level than did students who discussed their studies on a regular basis.

- Geography instruction is limited for grade 4 students. More than 60 percent of students had teachers who reported spending less than 45 minutes per week on geography instruction. Most eighth-grade students reported having taken at least one geography class since the sixth grade.

- Twenty-six percent of fourth graders, 19 percent of eighth graders, and 14 percent of twelfth graders indicated that geography was their favorite subject. At all grades, students who indicated that geography was their favorite subject performed at a higher level than did those who indicated that they liked other subjects better.

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About This Report

As the nation's *Report Card* in geography, this document provides a broad examination of students' learning. In addition, specific aspects of students' performance and their experiences at home and school are reviewed in some depth. As such, this report provides a portrait of what students know and can do in geography, as well as the contexts in which they have developed their geographic knowledge and skills.

A limited assessment of the geography achievement of high school seniors was conducted by NAEP in conjunction with the National Geographic Society in 1988. However, the content framework that underlies the NAEP 1994 geography assessment is markedly different from the framework used for the 1984 assessment. Therefore, information cannot be reported on trends in high school seniors' geography achievement between 1988 and 1994.

Chapter 1 presents the overview of the NAEP 1994 geography assessment — its content framework, design, and administration. Also included in Chapter 1 are sample questions and student responses from the assessment. Chapter 2 provides overall average scale score results for the nation, regions, and subgroups of students. Chapter 3 describes student performance in terms of achievement levels. Chapter 4 describes contextual factors related to students' geography achievement. Chapter 5 describes the specific abilities that students demonstrated on the NAEP 1994 geography assessment and reports student performance in different content areas of geography.

CHAPTER 1

NAEP 1994 Assessment in Geography

"The social progress, order, security, and peace of each country are necessarily connected with the social progress, order, security, and peace of all other countries."
Pope John XXIII

Introduction

Governments, economies, and ecosystems do not exist in isolation. People and regions are connected by trade agreements, global markets, communications networks, political alliances, and international organizations. Increasingly, nations are sharing concerns about the global environment. United States foreign and economic policies must account for events across the globe: Competition for jobs in Peoria is as likely to come from Kuala Lumpur as from Fresno. Events from around the world, such as the unification of Germany, affect us in profound ways. If our children are to be productive and responsible citizens of both the United States and the global community, they must know and understand the connections among the world's regions and peoples and the circumstances that lead these connections to evolve and change. In other words, they must have a working knowledge of the subject of geography.

Geography in American Education

In spite of the importance of geographic skills and competencies, geography has occupied an inconsistent place in the American classroom. In the nineteenth century, geography was viewed as a core element of the school curriculum. However, with the growth of the field of social studies since the second decade of the twentieth century, geography began to be squeezed out of the curriculum. In addition, pressure on schools to include a range of different subjects in their instructional programs has further reduced the time allocated to geography.[1]

Attitudes toward the place of geography in the school curriculum began to undergo a substantial change in the 1980s. Concerned about levels of geographic literacy in our nation's schools, the National Council for Geographic Education and the American Association of Geographers created a joint committee to reestablish geography in the school curriculum. Their report, *Guidelines for Geographic Education: Elementary and Secondary Schools* (1984), provided educators with five themes central to the teaching and learning of geography.[2] This document was disseminated broadly to teachers and geography educators.

Also in the mid-1980s, the National Geographic Society, through commentaries in the *National Geographic* magazine, began calling for substantial changes in American attitudes toward geography and the United States educational system.[3] In addition, the National Geographic Society and the National Center for Education Statistics (NCES) commissioned a NAEP geography assessment of high school seniors in 1988.[4] The information provided by this assessment, along with data from a 1988 Gallup survey of geographic literacy, suggested the need for significant reform of geographic education in the United States. Both surveys indicated that student knowledge and skills were far short of what was needed for responsible and productive citizenship.[5]

When President Bush convened the nation's governors at the education summit in 1989, the value of geography and the need for better geography education were further emphasized when geography was established as one of five core subjects in the nation's schools. Subsequently NAEP was authorized to conduct a comprehensive assessment of geography in 1994 at grades 4, 8, and 12.

Overview of the 1994 National Assessment of Educational Progress (NAEP)

A project of the NCES, NAEP collects valuable information about what students know and can do in different curricular areas. Since being initiated by Congress in 1969, NAEP has carried out its federally supported mandate as the only ongoing national assessment of student achievement. Both public and nonpublic school students in grades 4, 8, and 12 are regularly sampled and assessed in reading, history, geography, mathematics, science, writing, and other subjects. The assessments are based on content frameworks developed through a national consensus process involving teachers, curriculum experts, parents, and members of the general public. The frameworks attempt to maintain a balance between current instructional efforts, curriculum reform, research results, and desirable levels of achievement.

The NAEP 1994 geography assessment was administered to national samples of fourth-, eighth-, and twelfth-grade students attending public and nonpublic schools. In all, approximately 19,000 students were assessed. Students' geography performance is described on a scale ranging from 0 to 500 and in relation to three levels of achievement: *Basic*, *Proficient*, and *Advanced*. The assessment results are reported for national populations and for specific subgroups.

The NAEP 1994 Geography Framework

The structure and content of the assessment were determined by the *Geography Framework for the 1994 National Assessment of Educational Progress*.[6] Although geography had been assessed at the grade 12 level in 1988, the 1994 framework offered a new description of the content of the discipline and mandated a new format for the assessment. This forward-looking framework was developed under the auspices of the National Assessment Governing Board (NAGB) through a consensus process managed by the Council of Chief State School Officers. The consensus process involved more than 50 educators, policymakers, professional geographers, representatives of the business community, assessment experts, and curriculum specialists. In addition, several hundred other experts and interested members of the public contributed to the development process, either by participating in hearings or by reviewing drafts of documents.

The NAEP 1994 geography framework is organized along two dimensions, a content dimension and a cognitive dimension. The three content areas of the framework — **Space and Place, Environment and Society,** and **Spatial Dynamics and Connections** — served to clarify specifics of subject matter that were measured in the 1994 geography assessment.

The cognitive dimension of the framework specified areas of thinking expected of students as they embrace specific geography content. These cognitive areas were defined as **Knowing, Understanding,** and **Applying.**

As Figure 1.1 illustrates, the content and cognitive dimensions of the framework form a matrix: The assessment addresses each cognitive process in each content area. The content and cognitive areas of the geography framework are described in greater detail in the following sections.

Figure 1.1 NAEP 1994 Geography Assessment Framework Elements

Cognitive Dimension	Content Dimension		
	Space and Place	Environment and Society	Spatial Dynamics and Connections
Knowing	Where is the world's largest tropical rain forest?	What mineral resources are often extracted by strip mining?	What factors stimulate human migrations?
Understanding	Why are tropical rain forests located near the equator?	Explain the effects of strip mining and shaft mining on the landscape.	Explain the motivations of modern-day Mexicans and Cubans for immigrating to the United States.
Applying*	Support the conclusion that tropical rain forests promote wide species variation.	How can both economic and environmental interests be reconciled in an area of strip mining?	Compare current settlement and employment patterns of Cuban and Mexican immigrants in the United States.

Note: Example questions are illustrative only, and are not meant to represent the full array of assessment content.
*Applying refers to a range of higher-order thinking skills.
SOURCE: Geography Framework for the 1994 National Assessment of Educational Progress (1994), NAGB.

Geography Content Areas

Three geography content areas form the core organizing structure of the framework. The content areas were intended to ensure that all branches of geographic study were covered and that emphases on various areas were balanced. The content areas are also used to define subscales for reporting. The content areas, as described in the assessment framework, are summarized below.[7]

1. **Space and Place:** ***Knowledge of geography as it relates to particular places on Earth, to spatial patterns on Earth's surface, and to physical and human processes that shape such spatial patterns.***

The study of space and place is basic to geography. Space is the basic resource and organizing element for the discipline. Patterns that are illustrated on maps reflect both natural features and human activities. This content area requires students to distinguish between and understand the spatial distribution of physical and human characteristics. To accomplish this, they must locate significant features and places on Earth, recognize existing patterns in the distribution of features and places, and comprehend the reasons for the development and existence of these patterns.

2. **Environment and Society:** ***Knowledge of geography as it relates to the interactions between environment and society.***

Geography is an integrative discipline that focuses on the interrelationships between the physical environment and society. Human adaptation to and modification of the environment have been of continual and increasing importance to economies and polities. Understanding the nature, scale, and ramifications of such environmental transformations is fundamental in geography education, and is the core of this content area.

Students must be aware that every environmental issue lends itself to many interpretations, depending on people's perspectives. Students must consider such multiple perspectives as they evaluate decisions about issues such as land use and resource development, because the results of such decisions often have complicated and unpredictable consequences. Making wise decisions concerning the costs and benefits of such environmental modification is an expressed goal of geography education.

Finally, students must understand the causes and effects of natural hazards and disasters on the livability of certain areas and that the phrase "a safe place to live" is subject to personal interpretation.

3. **Spatial Dynamics and Connections:** ***Knowledge of geography as it relates to spatial connections among people, places, and regions.***

This content area requires students to demonstrate comprehension of cultural, economic, and political regions and the connections among them, and explores critical problems in human interaction. Students must understand how peoples and places are alike and how they differ. They must demonstrate that a comprehensive understanding of these similarities and differences can contribute to our performance as citizens on both a personal and broad international scale.

Students should know that people of every nation are increasingly connected to and dependent upon other peoples and places of the world for both human and natural resources. In this content area, students must demonstrate the knowledge that the world's resources are unevenly distributed, and an understanding of how this contributes to the movements of people, patterns of trade, and patterns of conflict. Students also should understand the increasing significance of human interdependence as various populations are searching for clearer identities and independence.

Table 1.1 shows the percentages of assessment time to be devoted to each content area, as specified in the framework.

TABLE 1.1 **Distribution of Assessment Time Across Geography Content Areas**

Content Area	Grades 4, 8, and 12
Space and Place	40%
Environment and Society	30%
Spatial Dynamics and Connections	30%

Geography Cognitive Areas

The NAEP geography framework also outlines three cognitive areas to be assessed: **Knowing, Understanding,** and **Applying**. These are described below.[7]

1. **Knowing — What is it? Where is it?**

   In this area, students are assessed on their ability to perform two related functions concerning information: (1) an observation function and (2) a recall function. In general, tasks in this cognitive area are meant to measure students' ability to observe different elements of the landscape and to answer questions by recalling, for example, the name of a place or a resource indigenous to a particular country or by finding information about trading patterns among several countries.

2. **Understanding — Why is it there? How did it get there? What is its significance?**

   In this area, students are asked to attribute meaning to what has been observed and to explain events. Explaining events and placing them in context requires students to demonstrate the ability to comprehend, to see connections among diverse bits of geographic information, and to use that information to explain existing patterns and processes on Earth.

3. **Applying — How can knowledge and understanding be used to solve geographic problems?**

   In this area, students were involved in a range of higher order thinking skills. Students are asked to classify, hypothesize, use inductive and deductive reasoning, and form problem-solving models. This area of thinking calls on students to use many tools and skills of geography as they attempt to develop a comprehensive understanding of a problem en route to proposing viable solutions.

The cognitive areas are not used as reporting subscales, but rather were used in the assessment construction process to ensure appropriate coverage. Table 1.2 shows the percentages of the assessment time to be devoted to each cognitive level, as specified in the framework.

TABLE 1.2

Distribution of Assessment Time Across Cognitive Areas

Grade	Knowing	Understanding	Applying
4	45%	30%	25%
8	40%	30%	30%
12	30%	30%	40%

The NAEP 1994 Geography Assessment Instrument

Guided by the NAEP 1994 geography framework, test development staff at Educational Testing Service worked to craft an assessment that measured the range and breadth of skills central to geography. As a national assessment, it was imperative that the NAEP 1994 geography assessment reflect the scope of perspectives and opinions among educators about geography content and how it should be assessed. Therefore, the assessment development process encompassed an extensive series of reviews conducted by content and measurement experts, teachers, and researchers. All components of the assessment were evaluated for curricular relevance, developmental appropriateness, and adherence to the framework and test specifications.

The resulting assessment had many innovative and interesting features, each designed to allow for accurate measurement of the domain. Some of the most notable of these features are described below.

- As called for in the framework, over half of student assessment time was devoted to constructed-response questions. Some of these questions required short responses (one or two sentences), while many required more extended answers (a paragraph or more).
- The assessment used a wide range of stimulus materials designed to assess spatial and interpretive skills intrinsic to geography and to engage students as actively as possible in the assessment. Stimuli included maps, charts, cartoons, tables, text, historical documents, and photographs.
- One section of the assessment at each grade was designed to assess students' ability to work with atlases.
- Constructed-response questions were not limited to those that required students to produce written responses. At each grade, a certain number of questions asked students to create their own maps, charts, or other data displays.
- In addition to portions of the assessment that were structured as broad surveys of knowledge and skills, certain sections were designed to allow students to work in-depth on a particular topical area.

In addition to multiple-choice questions, the assessment included both short and extended constructed-response questions. The percentage of response time devoted to answering constructed-response questions was approximately 60 percent at each grade. Each constructed-response question was scored according to a scoring guide, or rubric, that gave credit for partially correct answers. The exercises called for a range of responses. Short constructed-response questions called for a word, a phrase, or a sentence or two to demonstrate understanding of specific material. Extended constructed-response questions called for more developed argument, gathering of evidence, or interpretation of data. Short constructed-response questions were scored according to three-part scoring guides, in which a score of 3 represented an appropriate answer, a score of 2 a partially correct answer, and a score of 1 an inappropriate answer. Extended constructed-response questions were scored according to four-part scoring guides, in which a 4 was assigned to complete responses, a 3 to responses that responded to essential components of the task, a 2 to partially correct responses, and a 1 to inappropriate answers. Many of the constructed-response questions were scaffolded; that is, students were asked to respond first to one portion of the question and then to another. In a few cases, students were asked to do other tasks, such as drawing a map.

A national field test of assessment exercises was conducted prior to use in the assessment to ensure their appropriateness for assessing geography knowledge. Statistical analyses and qualitative reviews were conducted in selecting materials from the field test to be included in the assessment. The NAEP 1994 geography assessment that emerged from this broad consensus and development effort represented a new generation of large-scale geography assessments.

Across the three grades assessed — fourth, eighth, and twelfth — a total of 228 multiple-choice, 80 short constructed-response, and 30 extended constructed-response questions comprised the NAEP1994 geography assessment. For efficiency, some questions were administered at two grade levels. The assessment design is discussed in more detail in Appendix A and in the *NAEP 1994 Technical Report*.

Description of School and Student Samples

As with all NAEP assessments, the schools and students participating in the 1994 geography assessment were selected through scientifically designed, stratified random sampling procedures. Approximately 19,000 students in 1,500 public and nonpublic schools across the country participated in the geography assessment.

The results presented in this report are based on representative samples of students at each of the three grades. Each selected school that participated in the assessment, and each student assessed, represented a portion of the population of interest. As a result, the findings provided in this report pertained to all fourth, eighth, and twelfth graders in the nation. (For a more detailed description of the sample and the sampling procedures, see Appendix A.)

Reporting NAEP Geography Results

The NAEP 1994 geography assessment provides a wealth of information on the geography abilities of the nation's fourth-, eighth-, and twelfth-grade students. To maximize usefulness to policymakers, educators, parents, and other interested parties, the NAEP results are presented both as average scores on the NAEP geography scale, and in terms of the percentage of students attaining NAEP geography achievement levels. Thus, NAEP results not only provide information about what students *know and can do,* but also indicate whether their achievement meets expectations of what students *should know and should be able to do.* Furthermore, the descriptions of skills and abilities expected of students at each achievement level help make the reporting of assessment results more meaningful.

The Geography Scale

Student responses to the NAEP 1994 geography assessment were analyzed to determine the percentage of students responding correctly to each multiple-choice question and the percentages of students responding in each of the score categories for constructed-response questions. Item response theory (IRT) methods were used to produce within-grade scales that summarize results for each of the three geography content areas described earlier. Each subscale for grade 4 was linked to the corresponding subscale for grade 8. Likewise, each subscale for grade 12 was linked to the corresponding subscale for grade 8. Then, each linked subscale was mapped onto a scale with a range of 0 to 500. These separate subscales were then weighted by the percentages shown in Table 1.1 to produce a composite NAEP geography scale. Chapters 2, 4, and 5 present results based on the geography scale. (The scales for each of the NAEP subjects assessed in 1994 — reading, U.S. history, and geography — were developed independently. Therefore, results should not be compared across subjects. Details of the scaling procedures are presented in the *NAEP 1994 Technical Report*.)

Geography Achievement Levels

The 1994 assessment results are also reported using the geography achievement levels as authorized by the NAEP legislation and adopted by the NAGB. The achievement levels are based on collective judgments gathered about what students *should know and should be able to do* relative to the body of content reflected in the NAEP assessment framework. Three achievement levels were defined for each grade level assessed: *Basic*, *Proficient*, and *Advanced*. The levels were defined by a broadly representative panel of teachers, education specialists, and members of the general public.

For reporting purposes, the achievement levels for each grade are placed on the NAEP geography scale defining in four ranges — *Basic*, *Proficient*, *Advanced*, and the region below *Basic*. Figure 1.2 presents the policy definitions of the three achievement levels. Chapter 3 contains specific descriptions for the geography achievement.

It should be noted that the setting of achievement levels on the national assessment is relatively new and in transition. Some evaluations have concluded that the percentage of students at certain levels may be underestimated.[8] On the other hand, critiques of those evaluations have found that such conclusions are not supported by the weight of the empirical evidence.[9]

Figure 1.2 Policy Definitions of NAEP Achievement Levels

Basic	This level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.
Proficient	This level represents solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.
Advanced	This level signifies superior performance.

The student achievement levels in this report have been developed carefully and responsibly, and have been subject to refinements and revisions in procedures as new technologies have become available. Upon review of the available information, the Commissioner of NCES has judged that the achievement levels are in a developmental status. However, the commissioner and the NAGB also believe that the achievement levels are useful and valuable in reporting on the educational achievement of students in the United States. Results reported in terms of the geography achievement levels are presented in Chapter 3 of this report.

Interpreting NAEP Results

The average geography scale scores and the percentages presented in this report are estimates because they are based on samples rather than on the entire population(s). As such, the results are subject to a measure of uncertainty, reflected in the standard errors of the estimates. These standard errors are presented in parentheses along with the estimated average scale scores or percentages in tables throughout this report.

The significant differences discussed in the following chapters take into account the standard errors associated with the estimates. The comparisons are based on statistical tests that consider both the magnitude of the differences between the average scale scores or percentages and the standard errors of those statistics. Throughout this report, differences are defined as significant when they are significant from a statistical perspective. This means that observed differences are unlikely to be due to chance factors associated with sampling variability. All differences reported are significant at the .05 level with appropriate adjustments for multiple comparisons. The term "significant," therefore, is not necessarily intended to imply judgment about the absolute magnitude or educational relevance of the differences. The term is intended to identify statistically dependable population differences as an aid in focusing subsequent dialogue among policymakers, educators, and the public.

The use of a common, cross-grade metric for the three geography subscales and the composite geography scale was primarily for ease of reporting. However, the methodology used to produce the 0 to 500 scales used to report fourth-, eighth-, and twelfth-grade results (described in Appendix A) may not allow meaningful comparisons across grades. Similarly, scale score differences (e.g., between subscale or composite scale averages for males and females) should probably not be compared across grade. The reader is best served by focusing on within-grade group comparisons and inferences.

Cautions in Interpretations. The reader is cautioned against using the NAEP results reported herein to make simple or casual inferences related to subgroup membership or the effectiveness of public and nonpublic schools. For example, performance differences observed among racial/ethnic subgroups are almost certainly associated with a broad range of socioeconomic and educational factors not discussed in this report and possibly not addressed by the NAEP assessment program. Similarly, differences between public and nonpublic schools may be better understood after accounting for factors such as composition of the student body, parents' highest level of education, and parental interest.

Sample Questions from the NAEP 1994 Geography Assessment

As discussed earlier, the NAEP 1994 geography assessment is a rich collection of exercises developed to survey the geographic knowledge and skills of students in grades 4, 8, and 12. Each student received a mixture of multiple-choice and constructed-response questions.

Figure 1.3 presents samples of assessment exercises. (Additional example questions are shown in Appendix C.) The tables accompanying the exercises present two types of percentages: (1) the overall percentage of students within a grade who answered the question correctly and (2) the percentages of students within each of the achievement level intervals — *Basic*, *Proficient*, and *Advanced* as well as the percentage of students below *Basic* — who answered the questions successfully. (A fuller description of the achievement levels can be found in Chapter 3. At grades 4 and 12, the percentages for students at the *Advanced* level are not presented for these questions because of small sample sizes.)

The first exercise presented in Figure 1.3 is a short constructed-response question administered at grade 4 that asks students to list an advantage and disadvantage of a particular method of waste disposal. A sample response for a student who received a score of "Complete" (defined as a score of 3 on a three-part scoring rubric) on this question is also provided. The table shows that few fourth graders (11 percent) provided answers that received a score of "Complete." Less than 1 percent of those students below *Basic* and only 8 percent of those who scored within the *Basic* achievement level interval provided answers rated as "Complete." Almost one-quarter (28 percent) of fourth graders who scored within the *Proficient* achievement level interval provided answers rated as "Complete."

The second exercise presented in Figure 1.3 is a multiple-choice question administered at grade 8. The table shows that about one-fifth (21 percent) of all eighth graders answered this question correctly. Seventeen percent of eighth graders who scored below the *Basic* achievement level answered the question correctly, compared to 19 percent for students who scored within the *Basic* level. One-quarter of students who scored within the *Proficient* achievement level interval and nearly half (47 percent) of students who scored within the *Advanced* level answered the question correctly.

The third exercise shown in Figure 1.3 is an extended constructed-response question administered at grade 12. The questions ask students to select a site for a proposed shopping center and to support their selection with available information. (Neither site alternative was "correct"; student responses were scored based on the students' ability to support their selection.) Sample responses for students who received scores of "Essential" and "Complete" (scores of 4 or 3 on a four-part scoring guide) are provided. For this extended constructed-response question, over half (55 percent) of all twelfth graders provided answers rated "Essential" or better. For those twelfth graders who scored below the *Basic* achievement level, 27 percent provided answers rated "Essential" or better, compared with 57 percent of students within the *Basic* level. Almost three-quarters (76 percent) of twelfth graders who scored within the *Proficient* achievement level interval provided answers rated "Essential" or better.

Figure 1.3 NAEP 1994 Geography Sample Questions

- **Example of a Grade 4 Short Constructed-Response Question**

WAYS TO GET RID OF WASTE

- Dumping far out in the ocean
- Burning
- Recycling
- Burying in landfills

From the list above, select one method of getting rid of waste and identify one advantage and one disadvantage of this method.

Method of waste disposal: ____

____

____

Advantage: ____

____

____

Disadvantage: ____

____

____

Geography Content Area: Environment and Society

Grade 4	**Percentage "Complete" Within Achievement Level Intervals**			
Overall Percentage Complete	***Below Basic*** **186 and below***	***Basic*** **187-239***	***Proficient*** **240-275***	***Advanced*** **276 and above***
11 (0.9)	**0 (0.1)**	**8 (1.3)**	**28 (3.2)**	*******

*NAEP geography composite scale range. ***Sample size insufficient to permit a reliable estimate (see Appendix A).
The standard errors of the estimated percentages appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Figure 1.3 NAEP 1994 Geography Sample Questions *(continued)*

Sample Response (Score of 3)

WAYS TO GET RID OF WASTE

- Dumping far out in the ocean
- Burning
- Recycling
- Burying in landfills

From the list above, select one method of getting rid of waste and identify one advantage and one disadvantage of this method.

Method of waste disposal: Recycling

Advantage: The waste will be use over and over

Disadvantage: Recycling needs heavy macheins to crush and melt the waste

A **Complete** response (score of 3) accurately describes an advantage and disadvantage of one method of waste disposal. Explanations should be both specific to that method and geographically logical.

Figure 1.3 NAEP 1994 Geography Sample Questions (*continued*)

Example of a Grade 8 Multiple-Choice Question (▶ indicates correct answer)

In the United States, most of the fertile soils of the Midwest were derived from

▶A glaciers
B volcanic activity
C decaying organic matter
D eroded sandstone

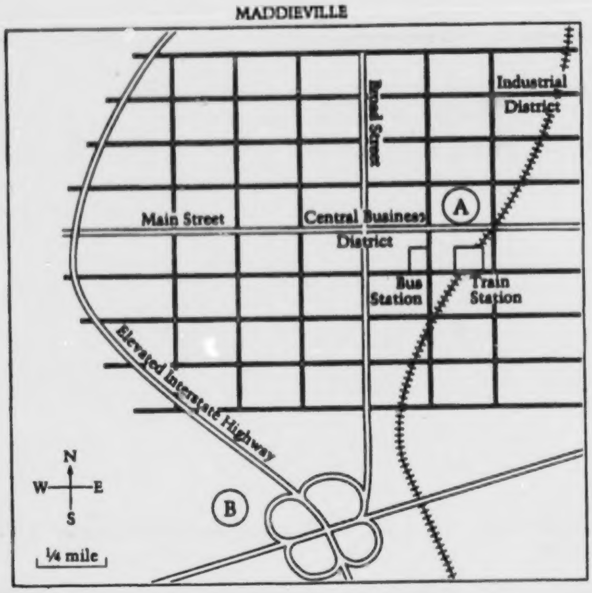
Geography Content Area: Environment and Society

Grade 8 Overall Percentage Correct	Percentage Correct Within Achievement Level Intervals			
	Below Basic 241 and below*	*Basic* 242-281*	*Proficient* 282-314*	*Advanced* 315 and above*
21 (1.2)	17 (2.1)	19 (2.4)	25 (3.3)	47 (11.2)

*NAEP geography composite scale range.
The standard errors of the estimated percentages appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Figure 1.3 NAEP 1994 Geography Sample Questions (*continued*)

Example of a Grade 12 Extended Constructed-Response Question


MADDIEVILLE
Industrial District
Broad Street
Main Street
Central Business District
A
Bus Station
Train Station
Elevated Interstate Highway
N
W
E
S
B
¼ mile

Maddieville is building a new shopping center. There is a disagreement in the city council over whether to build the shopping center at site A or at site B on the map.

As a resident of the city who would like to shop at the new shopping center, write a letter to the mayor in support of either site A or site B. Give three reasons why the site you support is better than the other site.

Geography Content Area: Spatial Dynamics and Connections

Grade 12	**Percentage "Essential" or "Complete" Within Achievement Level Intervals**			
Overall Percentage Essential or Complete	***Below Basic*** **269 and below***	***Basic*** **270-304***	***Proficient*** **305-338***	***Advanced*** **339 and above***
55 (1.5)	27 (3.2)	57 (2.7)	76 (2.8)	***

*NAEP geography composite scale range. ***Sample size insufficient to permit a reliable estimate (see Appendix A).
The standard errors of the estimated percentages appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Figure 1.3 NAEP 1994 Geography Sample Questions (*continued*)

Sample Response (Score of 3)

Maddieville is building a new shopping center. There is a disagreement in the city council over whether to build the shopping center at site A or at site B on the map.

As a resident of the city who would like to shop at the new shopping center, write a letter to the mayor in support of either site A or site B. Give three reasons why the site you support is better than the other site.

Mayor:

I am a resident of the city and would like to see the new mall be built. I think the better place to build it would be site B. As a resident of the city, things are already crowded and I, think it would be mere profitable if it was at site B because other people who don't live in the city but are just passing through on the interstate will stop and shop Please take this into consideration, the city is noisy and crowded already without the Chaos of a mall. Thank you,

A concern resident of a busy city

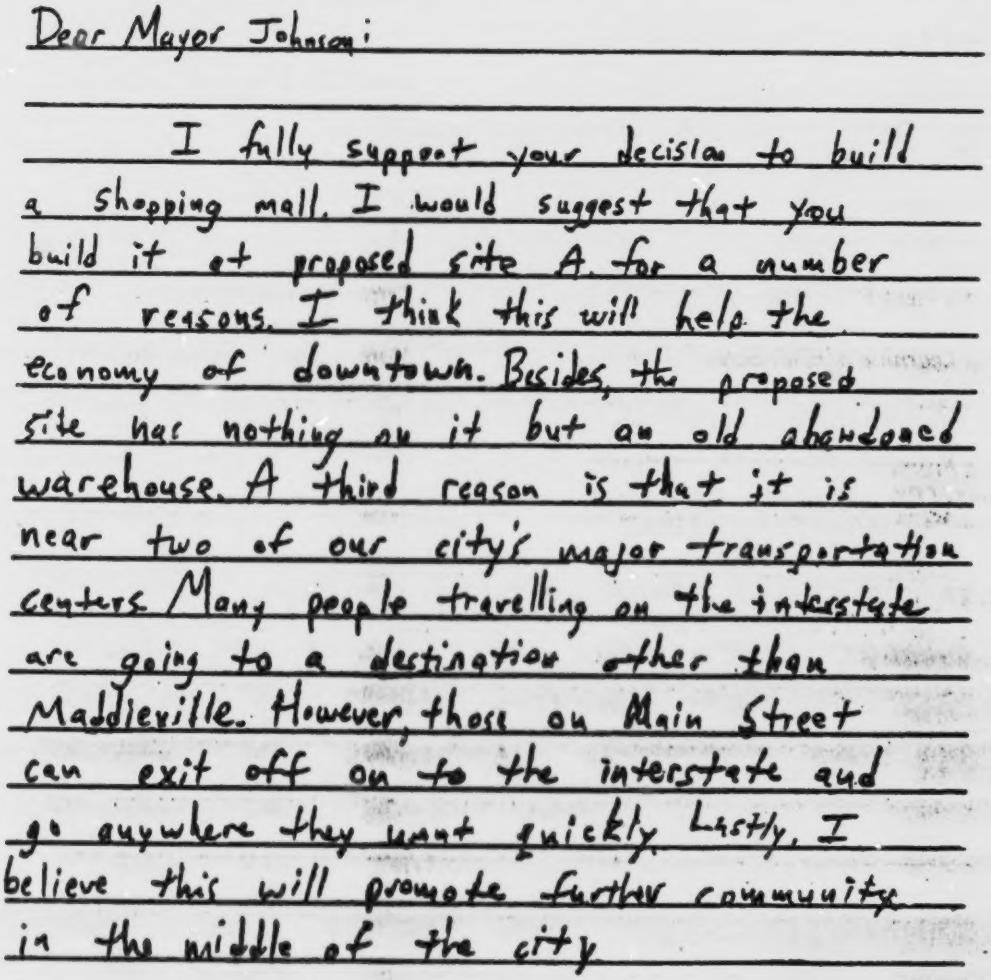
An **Essential** response (score of 3) chooses a site and supports the choice with two reasons.

Figure 1.3 NAEP 1994 Geography Sample Questions (continued)

Sample Response (Score of 4)

Maddieville is building a new shopping center. There is a disagreement in the city council over whether to build the shopping center at site A or at site B on the map.

As a resident of the city who would like to shop at the new shopping center, write a letter to the mayor in support of either site A or site B. Give three reasons why the site you support is better than the other site.



Dear Mayor Johnson:

I fully support your decision to build a shopping mall. I would suggest that you build it at proposed site A for a number of reasons. I think this will help the economy of downtown. Besides, the proposed site has nothing on it but an old abandoned warehouse. A third reason is that it is near two of our city's major transportation centers. Many people travelling on the interstate are going to a destination other than Maddieville. However, those on Main Street can exit off on to the interstate and go anywhere they want quickly. Lastly, I believe this will promote further community in the middle of the city

A **Complete** response (score of 4) chooses a site and gives three reasons for the choice.

Endnotes

1. Salter, C.L., *Missing the Magic Carpet: The Real Significance of Geographic Ignorance.* Educational Testing Service, 1990, Princeton, NJ. pp 10-11.

2. *Guidelines for Geographic Education: Elementary and Secondary Schools.* Washington, DC: Association of American Geographers and the National Council for Geographic Education, 1984.

3. Salter, C.L., *Missing the Magic Carpet: The Real Significance of Geographic Ignorance.* Educational Testing Service. 1990, Princeton, NJ. p 5.

4. Allen, R., Bettis, N., Kurfman, D., MacDonald, W., Mullis, I.V.S., & Salter, C. (1990), *The Geography Learning of High-School Seniors.* National Assessment of Educational Progress, Educational Testing Service, Princeton, NJ.

5. The NAEP survey found that, "Most students did not demonstrate an understanding of the basic concepts of physical and cultural geography, and many did not correctly identify the locations of major countries, cities, and landmarks." Allen et al. *The Geography Learning of High-School Seniors.* National Assessment of Educational Progress, Educational Testing Service, 1990, Princeton, NJ.

6. *Geography Framework for the 1994 National Assessment of Educational Progress.* Washington, DC: National Assessment Governing Board, 1994.

7. The content and cognitive area descriptions are taken from the *Geography Framework for the 1994 National Assessment of Educational Progress.* Washington, DC: National Assessment Governing Board, 1994.

8. *Education Achievement Standards, NAGB's Approach Yields Misleading Interpretations.* U.S. General Accounting Office Report to Congressional Requestors. GAO/PEMD-93-12 Educational Achievement Standards. Washington, DC: GPO, June 1993.

   Setting Achievement Levels for the Nation. The Second Report of the National Academy of Education Panel on the Evaluation of the NAEP Trial State Assessment, 1992 Trial State Assessment. Stanford, CA: National Academy of Education, 1993.

9. Cizek, G., *Reactions to National Academy of Education Report.* Washington, DC: National Assessment Governing Board, 1993.

   American College Testing, *Technical Report on Setting Achievement Levels on the 1992 National Assessment of Educational Progress in Mathematics, Reading, and Writing.* Washington, DC: National Assessment Governing Board, 1993.

CHAPTER 2

Geography Results for the Nation and Regions

Introduction

This chapter presents the overall NAEP geography scale scores of students in grades 4, 8, and 12. Findings are presented for the nation, regions of the country, and selected subgroups of students. Student performance is reported on the NAEP geography scale, which ranges from 0 to 500. (For a visual representation of student performance on each of the geography content subscales — also ranging from 0 to 500 — see Chapter 5.)

The results provided in this chapter address statistically significant differences that were found between reporting subgroups. In other cases, score estimates for various subgroups may appear to differ, but these differences are not statistically significant. (Significant differences are those that are unlikely to be due to sampling variability or chance.) All significant differences among reported subgroups are indicated to provide a comprehensive and balanced discussion of the results. However, when reading this report, statistical significance should not necessarily be equated with educational or instructional significance.

In addition, the NAEP 1994 geography assessment data are explored in more depth by examining the interactions among several major reporting variables. Average geography scale scores are examined for subgroups of students within various demographic populations. By doing so, it is possible to determine whether general patterns of geography performance for certain groups of students are related to additional background characteristics.

Geography Results for the Nation

Table 2.1 presents the average geography scale scores for fourth-, eighth-, and twelfth-grade students across the nation attending both public and nonpublic schools.

- At grade 4, the average geography scale score was 206. The bottom 10 percent of the population scored at or below 146 and the top 10 percent scored at or above 257.
- At grade 8, the average score was 260. The bottom 10 percent of the population scored at or below 213 and the top 10 percent of the population scored at or above 302.
- At grade 12, the average geography scale score was 285. The bottom 10 percent of the population scored at or below 244 and the top 10 percent scored at or above 321.

TABLE 2.1

Average Geography Scale Scores by Percentile
Grades 4, 8, and 12

Grade Levels	Average Scale Score	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile
Grade 4	206 (1.2)	146 (1.9)	179 (1.4)	211 (1.3)	237 (1.2)	257 (1.8)
Grade 8	260 (0.7)	213 (1.3)	237 (0.9)	263 (1.0)	285 (0.9)	302 (1.6)
Grade 12	285 (0.7)	244 (0.9)	265 (0.9)	287 (0.8)	306 (0.9)	321 (0.9)

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

TABLE 2.2 Average Geography Scale Scores, for the Nation and by Region Grades 4, 8, and 12

	Percentage of Students	Average Scale Score
Grade 4		
Nation	100	206 (1.2)
Region		
Northeast	22 (0.8)	203 (2.7)
Southeast	23 (1.0)	200 (2.5)
Central	25 (0.8)	215 (3.2)
West	30 (0.7)	205 (1.7)
Grade 8		
Nation	100	260 (0.7)
Region		
Northeast	20 (0.8)	266 (1.9)
Southeast	25 (1.0)	252 (1.6)
Central	24 (0.6)	268 (1.6)
West	31 (0.7)	255 (1.8)
Grade 12		
Nation	100	285 (0.7)
Region		
Northeast	21 (0.5)	284 (1.6)
Southeast	23 (0.8)	278 (1.1)
Central	28 (0.7)	289 (1.8)
West	29 (0.7)	286 (1.9)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

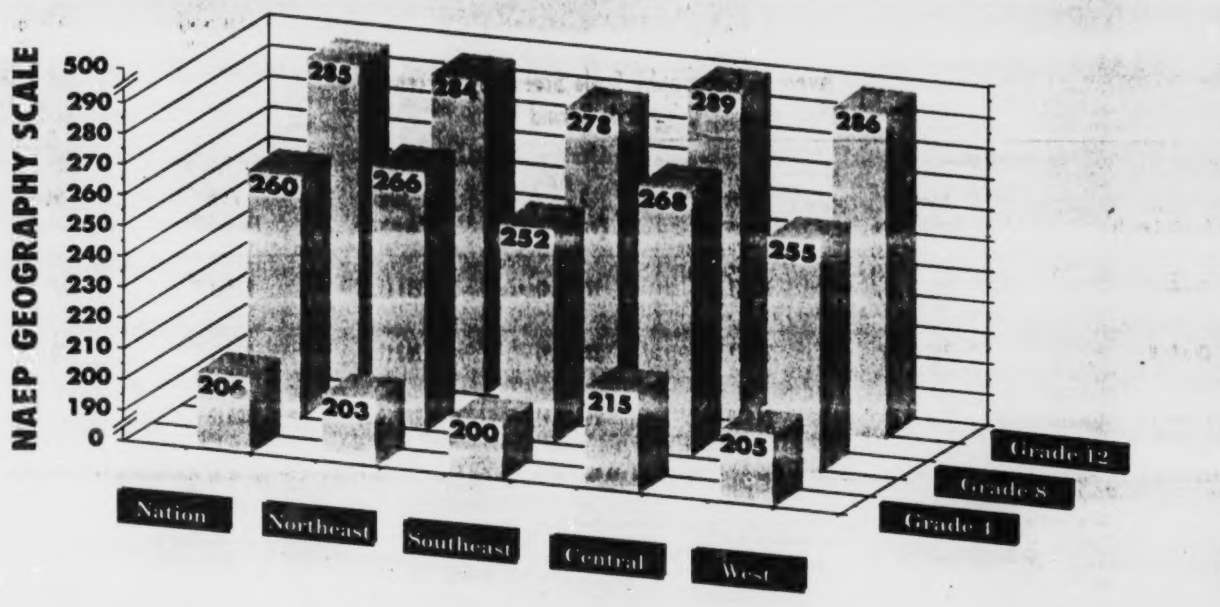
Table 2.2 and Figure 2.1 present results for the nation as well as the four regions of the country: Northeast, Southeast, Central, and West. (The composition of the regions is described in Appendix A.) At grade 4, students in the Central region outperformed those in the other three regions. At grade 8, the students in the Northeast and Central regions had higher average scores than their counterparts in the Southeast and West. Among grade 12 students, those in the Southeast had lower average scores than did those in each of the other regions.

Geography Results for Major Reporting Subgroups

Tables 2.3 through 2.8 present the average geography scale score estimates for major subgroups of the fourth-, eighth-, and twelfth-grade student populations.

Cautions in Interpretation. In interpreting the results presented in this section, the reader is cautioned against making simple or causal inferences related to subgroup membership or effectiveness of Title I programs or public and nonpublic schools. Performance differences among groups of students may result from differences in socioeconomic status and home background variables. For example, differences observed among racial/ethnic subgroups can almost certainly be associated with a broad range of socioeconomic and educational factors.

Figure 2.1 Average NAEP Geography Scale Scores by Grade and by Region



SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Similarly, differences between public and nonpublic schools may be better understood if differences in composition of the student body, parents' highest level of education, and parental involvement in education are considered.

Race/Ethnicity. As part of the background questionnaire that was administered in conjunction with the NAEP 1994 geography assessment, students were asked to identify themselves as belonging to one of six mutually exclusive categories: White, Black, Hispanic, Asian, Pacific Islander, and American Indian (including Alaskan Natives). Table 2.3 presents the average scale scores for racial/ethnic subgroups. The geography assessment, like other NAEP surveys, revealed substantial variation in performance among the different racial/ethnic subgroups. At all three grades, the average scores of White and Asian students were significantly higher than those of Black and Hispanic students. In addition, at all three grades, the average scores of Hispanic students were higher than those of Black students.

At grade 4, White and Asian students also outperformed American Indian students. American Indian students exhibited a higher average score than Black students. Finally, at grade 4, Pacific Islander students scored higher, on average, than did Black and Hispanic students.

At grades 8 and 12, the samples do not permit accurate determination of the standard errors associated with the average scale scores of Pacific Islander and American Indian students. For this reason, differences between these and other population subgroups are not discussed.

Gender. Table 2.4 presents the average geography scores for male and female students in grades 4, 8, and 12. At all three grades, male students had significantly higher average scale scores than did female students. Specifically, the average score for male students was five points higher than female students at grade 4, four points higher at grade 8, and seven points higher at grade 12.

TABLE 2.3

Average Geography Scale Scores by Race/Ethnicity Grades 4, 8, and 12

	Percentage of Students	Average Scale Score
Grade 4		
Nation	100	206 (1.2)
Race/Ethnicity		
White	69 (0.2)	218 (1.5)
Black	15 (0.1)	168 (2.5)
Hispanic	12 (0.2)	183 (2.5)
Asian	2 (0.2)	218 (5.0)
Pacific Islander	1 (0.1)	205 (5.3)
American Indian	1 (0.2)	193 (3.6)
Grade 8		
Nation	100	260 (0.7)
Race/Ethnicity		
White	69 (0.2)	270 (0.8)
Black	15 (0.1)	229 (1.7)
Hispanic	11 (0.1)	239 (1.9)
Asian	2 (0.1)	271 (2.7)
Pacific Islander	1 (0.4) !	252 (8.5) !
American Indian	2 (0.4) !	248 (3.4) !
Grade 12		
Nation	100	285 (0.7)
Race/Ethnicity		
White	74 (0.3)	291 (0.8)
Black	12 (0.4)	258 (1.4)
Hispanic	8 (0.2)	268 (1.5)
Asian	3 (0.2)	287 (3.2)
Pacific Islander	1 (0.3) !	282 (3.1) !
American Indian	1 (0.2) !	***

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding or, in the case of the race/ethnicity variable, because some students categorized themselves as "other."

! Interpret with caution any comparisons involving this statistic. The nature of the sample does not allow for accurate determination of the variability of this value.

*** Sample size insufficient to permit a reliable estimate (see Appendix A).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

TABLE 2.4

Average Geography Scale Scores by Gender Grades 4, 8, and 12

	Percentage of Students	Average Scale Score
Grade 4		
Nation	100	206 (1.2)
Gender		
Male	51 (1.0)	208 (1.4)
Female	49 (1.0)	203 (1.4)
Grade 8		
Nation	100	260 (0.7)
Gender		
Male	51 (0.7)	262 (0.9)
Female	49 (0.7)	258 (0.8)
Grade 12		
Nation	100	285 (0.7)
Gender		
Male	50 (1.0)	288 (0.8)
Female	50 (1.0)	281 (0.9)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Parents' Highest Level of Education. Students were asked to report on the education level of their parents or guardians: did not finish high school, graduated from high school, has some education after high school, or graduated from college. (Those who did not have this information chose the response option "I don't know.") The level of parents' education discussed in this section is the highest level reported by students for either parent.

Before reviewing the findings for parental education, it should be noted that approximately one in three fourth graders and one in ten eighth graders reported not knowing the highest level of education attained by either of their parents. Furthermore, research has questioned the accuracy of student reported data among similar groups of students.[1]

These caveats notwithstanding, the NAEP geography results indicate a strong positive relationship between parental education and student achievement. The results (summarized in Table 2.5) show that, as a general rule, groups of students reporting given levels of parental education had higher average scores than all groups reporting lower levels of education. The only exception to this pattern occurred at grade 4. There was no significant difference in performance between fourth graders who reported that a parent had completed college and those who reported that a parent had completed some education after high school.

TABLE 2.5 **Average Geography Scale Scores by Parents' Highest Level of Education Grades 4, 8, and 12**

	Percentage of Students	Average Scale Score
Grade 4		
Nation	100	206 (1.2)
Parents' Education Level		
Graduated College	42 (1.0)	216 (1.6)
Some Education After High School	7 (0.4)	216 (2.5)
Graduated High School	12 (0.6)	197 (2.5)
Did Not Finish High School	4 (0.4)	186 (3.7)
I Don't Know	34 (0.9)	197 (1.4)
Grade 8		
Nation	100	260 (0.7)
Parents' Education Level		
Graduated College	42 (1.2)	272 (1.0)
Some Education After High School	19 (0.7)	265 (1.0)
Graduated High School	22 (0.9)	250 (1.2)
Did Not Finish High School	7 (0.5)	238 (1.7)
I Don't Know	10 (0.5)	234 (1.5)
Grade 12		
Nation	100	285 (0.7)
Parents' Education Level		
Graduated College	44 (1.2)	294 (0.9)
Some Education After High School	25 (0.7)	286 (1.0)
Graduated High School	22 (0.8)	274 (1.1)
Did Not Finish High School	7 (0.4)	263 (1.2)
I Don't Know	3 (0.2)	257 (2.8)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Type of Location. Each participating school in the NAEP 1994 geography assessment was classified according to its geographic location. The three types of location — central city, urban fringe/large town, and rural/small town — are based on U.S. Bureau of the Census definitions of standard metropolitan statistical areas, population size, and density. These categories indicate the geographic location of the students' school and are not intended to indicate or imply social or economic meanings for these location types. (The type of location classifications are described in Appendix A.) Table 2.6 presents results for students attending schools in each type of location.

TABLE 2.6 **Average Geography Scale Scores by Type of Location Grades 4, 8, and 12**

	Percentage of Students	Average Scale Score
Grade 4		
Nation	100	206 (1.2)
Type of Location		
Central City	35 (2.1)	196 (2.2)
Urban Fringe/Large Town	43 (2.4)	213 (1.9)
Rural/Small Town	22 (2.2)	207 (2.4)
Grade 8		
Nation	100	260 (0.7)
Type of Location		
Central City	36 (2.4)	255 (1.6)
Urban Fringe/Large Town	38 (2.9)	264 (1.3)
Rural/Small Town	26 (1.9)	261 (1.9)
Grade 12		
Nation	100	285 (0.7)
Type of Location		
Central City	31 (2.3)	282 (1.4)
Urban Fringe/Large Town	42 (2.8)	288 (1.4)
Rural/Small Town	26 (1.9)	282 (1.1)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

The relationship between this variable and performance differs somewhat across the three grades. At grades 4 and 8, students attending schools in central city locations had significantly lower average scores than did students in other types of locations. At grade 12, students attending schools in urban fringe/large town locations performed at a significantly higher level than those attending schools in other locations.

Title I Participation. Staff members at each school that took part in the NAEP 1994 geography assessment were asked to identify which of the students participated in Title I programs or received services funded by Title I grants.[2] The Title I legislation provides funds to state and local educational agencies to support mathematics and reading programs and initiatives aimed at assisting disadvantaged students (those who are failing or are at risk of failing) in low-income communities.

Table 2.7 presents the results for students who received Title I services and for those who did not. As stated earlier, differences in performance between these recipients and nonrecipients should not be viewed as an evaluation of Title I programs. Typically, Title I services are intended for students who score poorly on assessments.

TABLE 2.7 Average Geography Scale Scores by Title I Participation Grades 4, 8, and 12

	Percentage of Students	Average Scale Score
Grade 4		
Nation	100	206 (1.2)
Title I Participation		
Yes	13 (1.3)	162 (2.8)
No	87 (1.3)	212 (1.4)
Grade 8		
Nation	100	260 (0.7)
Title I Participation		
Yes	7 (1.0)	230 (3.0)
No	93 (1.0)	262 (0.8)
Grade 12		
Nation	100	285 (0.7)
Title I Participation		
Yes	2 (0.5) !	251 (2.1) !
No	98 (0.5)	285 (0.7)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

! Interpret with caution any comparisons involving this statistic. The nature of the sample does not allow for accurate determination of the variability of this value.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

The percentage of students receiving Title I services was larger at grade 4 (13 percent) than at grade 8 (7 percent). At grades 4 and 8, the average geography score for recipients of Title I programs was significantly lower than the average score for nonrecipients. (Differences for twelfth graders are not discussed here because the nature of the grade 12 sample does not allow for accurate estimation of the variability of the percentage and average scale score for Title I recipients.)

Type of School. The national assessment collects data on students attending both public and nonpublic schools. Nonpublic schools include Catholic, other religious, and private institutions. As shown in Table 2.8, students in nonpublic schools outperformed students in public schools at all three grades.

As noted in Chapter 1, the reader is cautioned against using these results to make simplistic inferences about the relative effectiveness of public and nonpublic schools. Average performance differences between the two types of schools may, in part, be related to socioeco-

TABLE 2.8 Average Geography Scale Scores by Type of School Grades 4, 8, and 12

	Percentage of Students	Average Scale Score
Grade 4		
Nation	100	206 (1.2)
Type of School		
Public Schools	90 (0.8)	204 (1.4)
Nonpublic Schools	10 (0.8)	221 (2.2)
Catholic Schools	6 (0.7)	222 (2.6)
Other Nonpublic Schools	4 (0.5)	220 (3.8)
Grade 8		
Nation	100	260 (0.7)
Type of School		
Public Schools	90 (0.8)	258 (0.8)
Nonpublic Schools	10 (0.8)	276 (1.3)
Catholic Schools	6 (0.6)	276 (1.6)
Other Nonpublic Schools	4 (0.6)	276 (2.6)
Grade 12		
Nation	100	285 (0.7)
Type of School		
Public Schools	89 (1.0)	283 (0.8)
Nonpublic Schools	11 (1.0)	294 (1.6)
Catholic Schools	6 (0.9)	291 (3.0)
Other Nonpublic Schools	4 (0.6)	298 (2.0)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages for students in the two types of nonpublic schools may not total the percentage in nonpublic schools only due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

nomic and sociological factors, such as levels of parental involvement in their child's education. To get a clearer picture of the differences between public and nonpublic schools, more in-depth analyses must be undertaken.

An In-Depth Look at Selected Background Characteristics

One way to take a closer look at the performance of students within selected demographic populations is to see if the magnitude of the differences among groups of students varies when other background characteristics are taken into account. This section presents NAEP geography results for subgroups of students within various demographic populations. Three specific background characteristics are explored with these analyses: gender, race/ethnicity, and parents' highest level of education. In addition, type of school (public and nonpublic) results conditioned on parents' education are examined.

Many factors can influence differences among subgroups. While looking at some of the NAEP variables concurrently yields interesting results, these results can be due to a variety of circumstances that cannot be controlled for in a large-scale assessment such as NAEP.

Gender and Race/Ethnicity. The first two student characteristics examined are gender and race/ethnicity. As mentioned earlier, at all three grades, male students outperformed female students, and White students displayed higher average scores than Black or Hispanic students. (Asian, Pacific Islander, and American Indian students are not included in this section because, for the purposes of this analysis, their sample sizes are insufficient.) One question that might be asked is whether or not this pattern in male and female students' scores holds regardless of race/ethnicity. Furthermore, was the difference in performance between male and female students larger in some racial/ethnic subgroups than in others?

TABLE 2.9

Average Geography Scores of Male and Female Students by Race/Ethnicity Grades 4, 8, and 12

THE NATION'S REPORT CARD 1994 Geography Assessment

	Overall	White	Black	Hispanic
Grade 4				
Male	208 (1.4)	222 (1.7)	166 (3.0)	184 (3.5)
Female	203 (1.4)	214 (1.8)	169 (2.9)	183 (2.5)
Male - Female =	*5 (2.0)* *	*8 (2.5)* *	*–4 (4.2)*	*1 (4.3)*
Grade 8				
Male	262 (0.9)	272 (1.1)	232 (2.1)	239 (2.1)
Female	258 (0.8)	268 (0.8)	227 (1.8)	239 (2.6)
Male - Female =	*4 (1.2)* *	*4 (1.4)* *	*4 (2.7)*	*0 (3.3)*
Grade 12				
Male	288 (0.8)	294 (0.9)	263 (1.8)	271 (2.1)
Female	281 (0.9)	288 (1.0)	254 (1.7)	264 (1.9)
Male - Female =	*7 (1.2)* *	*6 (1.3)* *	*9 (2.4)* *	*6 (2.8)* *

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Differences were calculated prior to rounding.

* Indicates either an overall significant difference, or a significant difference between male and female students by racial/ethnic subgroups.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Table 2.9 presents results of analyses carried out to answer these questions. Average scores of male and female students and the differences between these averages are presented separately for three racial/ethnic subgroups. Overall, male students outperformed female students across all three grades. However, when the racial/ethnic subgroups are examined, the differences for White students at grades 4 and 8, and all three racial/ethnic groups at grade 12 were significant.

A comparison of the magnitude of the average score differences between male and female students yielded no evidence that these differences varied significantly across racial/ethnic groups of students.

Gender and Parental Education. Table 2.10 presents an analysis of gender differences in geography performance relating to parents' highest level of education. Average scores of male and female students and the differences between these averages are presented separately for the different levels of parental education reported by students. One question that can be answered with these data is whether or not differences in average geography scores between male and female students were evident for students at all levels of parental education. Furthermore, were gender differences larger at some parental education levels than at others?

Consistent with the overall gender results, average scale scores at grade 12 were higher for males than for females across all levels of parental education. Also, at grade 4 for students reporting that at least one parent graduated college, males outperformed females.

Again, a comparison of the magnitude of the average score differences between male and female students yielded no evidence that these differences varied significantly across parental education levels.

TABLE 2.10

Average Geography Scores of Male and Female Students in Relation to Parents' Highest Level of Education
Grades 4, 8, and 12

	Overall	Less than High School	Graduated High School	Some Education After High School	Graduated College
Grade 4					
Male	208 (1.4)	187 (5.2)	196 (3.1)	217 (3.5)	219 (2.1)
Female	203 (1.4)	185 (5.0)	199 (3.9)	215 (3.4)	212 (1.8)
Male - Female =	*5 (2.0)* *	*2 (7.2)*	*–2 (5.0)*	*2 (4.8)*	*7 (2.7)* *
Grade 8					
Male	262 (0.9)	241 (3.0)	251 (1.6)	267 (1.6)	273 (1.4)
Female	258 (0.8)	236 (2.0)	249 (1.6)	263 (1.6)	271 (1.1)
Male - Female =	*4 (1.2)* *	*4 (3.6)*	*2 (2.3)*	*4 (2.2)*	*2 (1.8)*
Grade 12					
Male	288 (0.8)	270 (2.1)	277 (1.4)	290 (1.4)	297 (1.1)
Female	281 (0.9)	257 (2.1)	270 (1.2)	283 (1.1)	291 (1.0)
Male - Female =	*7 (1.2)* *	*13 (3.0)* *	*7 (1.8)* *	*7 (1.8)* *	*6 (1.5)* *

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Differences were calculated prior to rounding.

* Indicates either an overall significant difference, or a significant difference between male and female students by level of parents' education.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Type of School (Public and Nonpublic) and Parental Education. As reported earlier in this chapter, at all grades students attending nonpublic schools had significantly higher average scores than those attending public schools. Was this difference in geography performance between nonpublic and public schools evident at all levels of parental education? Furthermore, was the difference in performance larger for some levels of parental education than for others?

Table 2.11 presents results of analyses carried out to address these questions. One striking result presented in Table 2.11 is that the sample sizes for students attending nonpublic schools whose parents did not graduate high school were too small to estimate an average score. Therefore, discussions of public/nonpublic differences at this level of parental education are not possible. As with the overall results, students attending nonpublic schools in each grade had higher average scores than their public school counterparts across all levels of parental education. All of these differences were significant, with the exception of twelfth graders who reported that at least one parent had some education after high school. (Again, the reader is cautioned against drawing causal inferences from these results.)

A comparison of the magnitude of the average score differences between nonpublic and public school students yielded little or no evidence that these differences varied significantly across levels of parental education.

Race/Ethnicity and Parental Education. Racial/ethnic differences in twelfth-grade average geography scores are presented in relation to parental education levels in Table 2.12. The average scores of White, Black, and Hispanic students and the differences between those scores are presented separately for the different levels of parents' education reported by students. One question that can be answered with these data is whether or not the differences in average geography scores among White, Black, and Hispanic students were evident for students at all levels of parental education. In addition, were the performance differences between racial/ethnic groups larger at some parental education levels than at others?

TABLE 2.11

Average Geography Scores of Students Attending Public and Nonpublic Schools in Relation to Parents' Highest Level of Education
Grades 4, 8, and 12

	Overall	Less than High School	Graduated After High School	Some Education After High School	Graduated College
Grade 4					
Public	204 (1.4)	185 (3.8)	196 (2.7)	215 (2.8)	214 (1.8)
Nonpublic	221 (2.2)	***	215 (4.3)	226 (3.6)	228 (2.6)
Public - Nonpublic =	***–17 (2.6) ****	***	***–18 (5.1) ****	***–11 (4.6) ****	***–13 (3.2) ****
Grade 8					
Public	258 (0.8)	237 (1.8)	249 (1.3)	264 (1.1)	271 (1.1)
Nonpublic	276 (1.3)	***	264 (2.9)	276 (1.7)	281 (1.5)
Public - Nonpublic =	***–18 (1.6) ****	***	***–15 (3.2) ****	***–12 (2.0) ****	***–10 (1.9) ****
Grade 12					
Public	283 (0.8)	262 (1.2)	273 (1.2)	286 (1.1)	293 (1.0)
Nonpublic	294 (1.6)	***	280 (2.8)	289 (2.2)	301 (1.3)
Public - Nonpublic =	***–11 (1.8) ****	***	***–7 (3.1) ****	***–4 (2.4)***	***–7 (1.6) ****

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Differences were calculated prior to rounding.

* Indicates either an overall significant difference, or a significant difference between students attending public and nonpublic schools by level of parents' education.

*** Sample size insufficient to permit a reliable estimate (see Appendix A).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

At the twelfth grade, the average scores of White students was significantly higher than that of Black or Hispanic students across all levels of parental education. In addition, Hispanic twelfth graders significantly outperformed Black students at all levels of parental education. (Data for fourth and eighth graders are not presented in this tabulation because of wide variation among racial/ethnic groups in the accuracy of reporting parental education. For further details, see discussion in Appendix A under "Parents' Education Level.")

A comparison of the magnitude of the score differences among White, Black, and Hispanic students yielded no evidence that these differences varied significantly across levels of parental education, with one exception. The magnitude of the difference in geography scores between White and Black twelfth graders whose parents had some education after high school was less than the magnitude of the difference between White and Black students whose parents were college graduates.

The data in Table 2.12 show that the racial and ethnic differences in average geography scores, as in the other subjects assessed by NAEP in 1994, persist across different levels of parental educational attainment. These NAEP patterns run somewhat counter to previous findings from other studies. The National Education Longitudinal Study of 1988, with more complete measures of socioeconomic status, found substantial reductions in achievement differences associated with racial/ethnic group membership after accounting for family resources.[3] In addition, the College Board has found that racial differences on the Scholastic Aptitude Test are diminished somewhat when family income differences are taken into account.[4] So, the NAEP findings should be interpreted carefully in relation to these other results.

In interpreting these findings, it is important to understand that student achievement is a result of multiple factors including educational experience, resources from the home, and the larger social environment. These factors may also differ depending on the students' racial/ethnic groups and thus contribute — along with parents' educational level — to achievement differences. Such factors might contribute to reasonable explanations for why parents' educational levels might be associated differently with student achievement for different racial/ethnic groups.

TABLE 2.12

Average Geography Scores of White, Black, and Hispanic Students in Relation to Parents' Highest Level of Education
Grade 12

	Overall	Less than High School	Graduated High School	Some Education After High School	Graduated College
Grade 12					
White	291 (0.8)	270 (2.1)	279 (1.1)	291 (1.1)	299 (0.9)
Black	258 (1.4)	244 (3.4)	251 (2.2)	266 (1.9)	264 (2.0)
Hispanic	268 (1.5)	259 (2.2)	265 (2.0)	277 (3.4)	278 (2.5)
White - Black =	***33 (1.6) ****	***26 (4.0) ****	***28 (2.5) ****	***25 (2.2) ****	***36 (2.2) ****
White - Hispanic =	***23 (1.7) ****	***11 (3.0) ****	***15 (2.3) ****	***14 (3.5) ****	***21 (2.7) ****
Black - Hispanic =	***–9 (2.1) ****	***–16 (4.0) ****	***–14 (3.0) ****	***–11 (3.9) ****	***–14 (3.2) ****

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Differences were calculated prior to rounding.

* Indicates either an overall significant difference, or a significant difference between racial/ethnic subgroups by level of parents' education.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Summary

The NAEP geography assessment showed patterns of performance among reporting subgroups, some of whom consistently performed better than others. These patterns of performance were also evident in interactions among those reporting variables.

- Among the different regions of the nation, students' scores varied at each grade level. Grade 4 students from the Central region, for example, outperformed students from the other three regions.
- In general, the higher the level of parental education, the higher the level of student performance.
- White and Asian students at all three grades had higher scores than did Black and Hispanic students. Also, Hispanic students outperformed Black students at all three grades.
- At all three grades, male students scored higher than female students. At grade 12, these significant differences persisted across racial/ethnic subgroups and across all levels of parental education.
- Students in nonpublic schools outperformed public school students. These differences were significant regardless of parental education levels. The only exception was at grade 12 for students reporting parents had some education after high school.

Endnotes

1. Looker, E. D. (1989). Accuracy of proxy reports of parental status characteristics. *Sociology of Education, 62(4)*, 257-76.
2. As a result of the Elementary and Secondary Education Act reauthorized by Congress in 1994, the federal program formerly referred to as "Chapter One" was renamed "Title I."
3. Green, P. J., Dugone, B. L., Ingels, S. J., & Camburn, E. (1995). *A profile of the American high school senior in 1992.* Washington, DC: National Center for Education Statistics, NCES 95-384.
4. College Entrance Examination Board and Educational Testing Service (1995). *College bound seniors national profile report: SAT program test takers 1995.* Additional unpublished tables.

CHAPTER 3

Geography Achievement Levels

Introduction

The average geography performance of our nation's students as presented in the previous chapter can be explored further by considering the percentage of students who attained specific levels of achievement. Viewing students' performance from this perspective provides some insight into the adequacy of students' geographic knowledge and skills and the extent to which they are achieving expected levels of performance.

The National Education Statistics Act of 1994 requires that the National Assessment Governing Board develop "appropriate student performance levels" for reporting NAEP results. The NAEP law requires that these levels be "used on a developmental basis until the Commissioner of Education Statistics determines . . . that such levels are reasonable, valid, and informative to the public." It requires the Commissioner and the Board to make clear the developmental status of such levels.

The student achievement levels in this report have been developed and adopted by the National Assessment Governing Board, NAEP's independent policy-making body, with contributions from a wide variety of educators, business and government leaders, and interested citizens. These levels of student achievement have been established to help Americans answer two questions that are important to parents and to all citizens in the communities and nation in which we live. These questions are: "What should students know and be able to do as they progress and graduate from school?" and "How good is good enough in terms of student achievement on NAEP?" Answering these questions obviously involves judgments. The National Assessment Governing Board is not suggesting that there is a single answer to these questions. Rather, the Board is trying to put forward reasonable judgments that can inform citizens across America — information they can use to answer these questions in their own schools and communities.

Developing carefully considered judgments about "what students should know and should be able to do" and "how good is good enough" is both difficult and controversial. The Governing Board believes that these questions are so important that answers must be sought in an informed, responsible way. The process is subject to revision and refinement, as appropriate.

The student achievement levels in this report approved by the Governing Board are the result of many hours of work. The levels are based on preliminary descriptions developed as part of the national consensus process to determine the assessment design and content. The Board's contractor, American College Testing (ACT), which has extensive experience in standard-setting in many fields, designed the achievement level-setting process. This process was reviewed by scores of individuals, including policy-makers, professional organizations, teachers, parents, and other members of the general public. To develop the levels, ACT convened a cross-section of educators and interested citizens from across the nation and asked them to recommend what students should know and be able to do in geography. Prior to adopting these levels of student achievement, the Board engaged a large number of persons to comment on the recommended levels and to review the results.

The result of the achievement level-setting process is a set of achievement level descriptions, a set of achievement level cutpoints on the 500-point NAEP scale, and exemplar questions. The cutpoints are scores that define the *Basic*, *Proficient*, and *Advanced* achievement levels at grades 4, 8, and 12 on the NAEP scale. At present, evaluations conducted in other NAEP subject areas on the level-setting process and critiques of these evaluations have provided mixed reviews. Therefore, both the Governing Board and the Commissioner of Education Statistics regard the achievement levels as developmental; they should not be interpreted as statistically conclusive. Because these levels are still considered developmental, the reader of this report is advised to consider that status when interpreting the results. The reader should recognize that the results are based on the judgments, approved by the Governing Board, of what advanced, proficient, and basic students should know and be able to do in each subject assessed, as well as on their judgments regarding what percent of students at the borderline for each level should answer each test question correctly. The latter information is used in translating the achievement level descriptions into cutpoints on the NAEP scale. NCES uses these levels in reporting NAEP results, but it does not currently adjudicate the reliability or validity of these achievement levels. Rather they are reported directly as adopted by the Governing Board.

The National Assessment Governing Board urges all who are concerned about "what students should know and be able to do" and "how good is good enough" to read and interpret these performance levels recognizing that this is a developing, judgmental process and is subject to various interpretations. The decision to include the levels in NAEP reports is an attempt to make the assessment results more useful for parents, educators, and policymakers by providing performance standards against which to measure educational progress.

The three geography achievement levels — *Basic, Proficient,* and *Advanced* — were established by the National Assessment Governing Board for reporting NAEP results. As described in Chapter 1, the *Basic* level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade. The *Proficient* level represents solid academic performance and demonstrated competence over challenging subject matter. The *Advanced* level signifies superior performance. The geographic knowledge and skills associated with each achievement level are described in Figure 3.1.

The geography achievement levels attained by fourth-, eighth-, and twelfth-grade students in the NAEP assessment are presented in this chapter. Results are displayed for the nation, regions of the country, and major reporting subgroups. The cautions mentioned in Chapter 2 also are warranted when interpreting differences among subgroups.

Figure 3.1 Geography Achievement Levels

GRADE 4

Basic (187)	Students should be able to use words or diagrams to define basic geographic vocabulary; identify personal behaviors and perspectives related to the environment and describe some environmental and cultural issues in their community; use visual and technological tools to access information; identify major geographic features on maps and globes; be able to read and draw simple maps, map keys and legends; demonstrate how people depend upon, use, and adapt to the environment; and give examples of the movement of people, goods, services, and ideas from one place to another. In addition to demonstrating an understanding of how individuals are alike and different, they should demonstrate a knowledge of the ways people depend on each other.
Proficient (240)	Students should be able to use fundamental geographic knowledge and vocabulary to identify basic geographic patterns and processes; describe an environmental or cultural issue from more than one perspective; and read and interpret information from visual and technological tools such as photographs, maps and globes, aerial photography, and satellite images. They should be able to use number and letter grids to plot specific locations; understand relative location terms; and sketch simple maps and describe and/or draw landscapes they have observed or studied. Proficient students should be able to illustrate how people depend upon, adapt to, and modify the environment, describe and/or illustrate geographic aspects of a region using fundamental geographic vocabulary and give reasons for current human migration; discuss the impact a location has upon cultural similarities and differences; and be able to demonstrate how an event in one location can have an impact upon another location.
Advanced (276)	Students should be able to use basic geographic knowledge and vocabulary to describe global patterns and processes; describe ways individuals can protect and enhance environmental quality; describe how modifications to the environment may have a variety of consequences; explain differing perspectives that apply to local environmental or cultural issues; and demonstrate an understanding of forces that result in migration, changing demographics, and boundary changes. They should be able to solve simple problems by applying information learned through working with visual and technological tools such as aerial and other photographs, maps and globes, atlases, news media, and computers. They should be able to construct models and sketch and label maps of their own state, the United States, and the world; use them to describe and compare differences, similarities, and patterns of change in landscapes; and be able to predict the impact a change in one location can have on another. They should be able to analyze the ways individuals and groups interact.

Figure 3.1 Geography Achievement Levels (*continued*)

GRADE 8

Basic (242)	Students should possess fundamental knowledge and vocabulary of concepts relating to patterns, relationships, distance, direction, scale, boundary, site, and situation; solve fundamental locational questions using latitude and longitude; interpret simple map scales; identify continents and their physical features, oceans, and various countries and cities; respond accurately to descriptive questions using information obtained by use of visual and technological tools such as geographic models and/or translate that information into words; explain differences between maps and globes; and find a wide range of information using an atlas or almanac. Students should be able to recognize and illustrate the relationships that exist between humans and their environments, and provide evidence showing how physical habitat can influence human activity. They should be able to define a region and identify its distinguishing characteristics. Finally, they should be able to demonstrate how the interaction that takes place between and among regions is related to the movement of people, goods, services, and ideas.
Proficient (282)	Students should possess a fundamental geographic vocabulary; understand geography's analytical concepts; solve locational questions requiring integration of information from two or more sources, such as atlases or globes; compare information presented at different scales; identify a wide variety of physical and cultural features and describe regional patterns. Students should be able to respond accurately to interpretive questions using geography's visual and technological tools and translate that information into patterns; identify differences in map projections and select proper projections for various purposes; and develop a case study working with geography's analytical concepts. In addition, students should be able to describe the physical and cultural characteristics of places; explain how places change due to human activity; explain and illustrate how the concept of regions can be used as a strategy for organizing and understanding Earth's surface. Students should be able to analyze and interpret data bases and case studies as well as use information from maps to describe the role that regions play in influencing trade and migration patterns and cultural and political interaction.
Advanced (315)	Students should have a command of extensive geographic knowledge, analytical concepts, and vocabulary; be able to analyze spatial phenomena using a variety of sources with information presented at a variety of scales and show relationships between them; and use case studies for spatial analysis and to develop maps and other graphics. Students should be able to identify patterns of climate, vegetation, and population across Earth's surface and interpret relationships between and among these patterns, and use one category of a map or aerial photograph to predict other features of a place such as vegetation based on climate or population density based on topographic features. Students should also be able to relate the concept of region to specific places and explain how regions change over time due to a variety of factors. They should be able to profile a region of their own design using geographic concepts, tools, and skills.

GRADE 12

Basic (270)	Students should possess a knowledge of concepts and terms commonly used in physical and human geography as well as skills enabling them to employ applicable units of measurement and scale when solving simple locational problems using maps and globes. They should be able to read maps; provide examples of plains, plateaus, hills, and mountains; and locate continents, major bodies of water, and selected countries and cities. They should be able to interpret geographic data and use visual and technological tools such as charts, tables, cartograms, and graphs; know the nature of and be able to identify several basic types of map projections; understand the basic physical structure of the planet; explain and apply concepts such as continental drift and plate tectonics; and describe geography's analytical concepts using case studies. Students should have a comprehensive understanding of spatial relationships including the ability to recognize patterns that exist across Earth in terms of phenomena, including climate regions, time zones, population distributions, availability of resources, vegetation zones, and transportation and communication networks. They should be able to develop data bases about specific places and provide a simple analysis about their importance.
Proficient (305)	Students should have an extensive understanding and knowledge of the concepts and terminology of physical and human geography. They should be able to use geographic concepts to analyze spatial phenomena and to discuss economic, political and social factors that define and interpret space. They should be able to do this through the interpretation of maps and other visual and technological tools, through the analysis of case studies, the utilization of data bases, and the selection of appropriate research materials. Students should be able to design their own maps based on descriptive data; describe the physical and cultural attributes of major world regions; relate the spatial distribution of population to economic and environmental factors; report both historical and contemporary events within a geographic framework using tools such as special purpose maps, and primary and secondary source materials.
Advanced (339)	Students should possess a comprehensive understanding of geographic knowledge and concepts; apply this knowledge to case studies; formulate hypotheses and test geographic models that demonstrate complex relationships between physical and human phenomena; apply a wide range of map skills; develop maps using fundamental cartographic principles including translating narratives about places and events into graphic representations, and use other visual and technological tools to perform locational analysis and interpret spatial relationships. Students should also be able to undertake sophisticated analysis from aerial photographs or satellite imagery and other visuals. Advanced students should be able to develop criteria assessing issues relating to human spatial organization and environmental stability and, through research skills and the application of critical thinking strategies, identify alternative solutions. They should be able to compile data bases from disparate pieces of information and from these data develop generalizations and speculations about outcomes when data change.

Geography Achievement Levels for the Nation and Regions

Table 3.1 shows the percentages of fourth-, eighth-, and twelfth-grade students at or above the three geography achievement levels. At all three grades, roughly 70 percent of students scored at or above the *Basic* level. Roughly one-quarter of the students at each grade were able to reach the *Proficient* level. Few students at any grade were at the *Advanced* level: 3 percent at the fourth grade, 4 percent at the eighth grade, and 2 percent at the twelfth grade. (Note that the percentage of students below *Basic* is 100 percent minus the percentage at or above *Basic*.)

There were several differences in regional performance on the geography assessment. At grade 4, the percentage of students in the Central region who reached the *Proficient* level was higher than the percentage in the Southeast. In addition, when compared with children from the Southeast and Northeast, a higher percentage of Central region students were able to reach the *Basic* level. There were no significant regional differences in attainment of the *Advanced* level.

At grade 8, a somewhat different pattern was evident. The percentages of students in the Central and Northeast regions who reached the *Proficient* and *Basic* levels were higher than the percentages for the Southeast and West. The percentage of students at the *Advanced* level was higher in the Central region than in the Southeast.

A smaller percentage of high school seniors reached the *Basic* level in the Southeast than in the rest of the country. In addition, the percentage of students in the Southeast who reached the *Proficient* level was lower than the percentages in the Central or West regions. At grade 12, there were no statistically significant regional differences in the attainment of the *Advanced* level.

TABLE 3.1

Geography Achievement Levels, for the Nation and by Region Grades 4, 8, and 12

		Percentage of Students			
	Percentage of Students	At Advanced	At or Above Proficient	At or Above Basic	Below Basic
Grade 4					
Nation	100	3 (0.4)	22 (1.2)	70 (1.1)	30 (1.1)
Region					
Northeast	22 (0.8)	3 (0.8)	22 (2.5)	67 (2.7)	33 (2.7)
Southeast	23 (1.0)	2 (0.5)	17 (2.0)	64 (2.6)	36 (2.6)
Central	25 (0.8)	4 (1.3)	28 (3.3)	78 (2.6)	22 (2.6)
West	30 (0.7)	3 (0.6)	21 (1.7)	70 (1.7)	30 (1.7)
Grade 8					
Nation	100	4 (0.4)	28 (1.0)	71 (1.0)	29 (1.0)
Region					
Northeast	20 (0.8)	6 (1.0)	33 (2.0)	76 (2.2)	24 (2.2)
Southeast	25 (1.0)	3 (0.5)	21 (1.6)	62 (2.1)	38 (2.1)
Central	24 (0.6)	6 (0.9)	36 (2.1)	80 (1.7)	20 (1.7)
West	31 (0.7)	3 (0.7)	23 (2.0)	67 (2.4)	33 (2.4)
Grade 12					
Nation	100	2 (0.5)	27 (1.2)	70 (0.9)	30 (0.9)
Region					
Northeast	21 (0.5)	2 (0.6)	25 (2.1)	69 (2.3)	31 (2.3)
Southeast	23 (0.8)	1 (0.6)	20 (1.3)	60 (1.5)	40 (1.5)
Central	28 (0.7)	2 (1.0)	32 (2.9)	75 (2.1)	25 (2.1)
West	29 (0.7)	2 (0.7)	29 (2.6)	72 (2.1)	28 (2.1)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Geography Achievement Levels for Major Reporting Subgroups

In this section, variations in performance among the major reporting subgroups are discussed. Again, the discussion is confined to those differences that were statistically significant.

Race/Ethnicity. Table 3.2 presents achievement level results for students in six racial/ethnic groups. Consistent with past assessments, results from the NAEP 1994 geography assessment indicated differences in performance among racial/ethnic subgroups. Significant differences among racial/ethnic groups were observed in the percentages of students at or above each of the three achievement levels: *Basic, Proficient,* and *Advanced.*

TABLE 3.2

Geography Achievement Levels by Race/Ethnicity Grades 4, 8, and 12

		Percentage of Students			
	Percentage of Students	At Advanced	At or Above Proficient	At or Above Basic	Below Basic
Grade 4					
Nation	100	3 (0.4)	22 (1.2)	70 (1.1)	30 (1.1)
Race/Ethnicity					
White	69 (0.2)	4 (0.6)	29 (1.6)	81 (1.3)	19 (1.3)
Black	15 (0.1)	0 (0.2)	3 (0.6)	34 (2.4)	66 (2.4)
Hispanic	12 (0.2)	1 (0.4)	10 (1.7)	49 (2.7)	51 (2.7)
Asian	2 (0.2)	5 (3.3)	32 (6.0)	79 (4.8)	21 (4.8)
Pacific Islander	1 (0.1)	1 (1.5)	17 (6.5)	70 (6.2)	30 (6.2)
American Indian	1 (0.2)	0 (1.5)	9 (3.9)	62 (5.7)	38 (5.7)
Grade 8					
Nation	100	4 (0.4)	28 (1.0)	71 (1.0)	29 (1.0)
Race/Ethnicity					
White	69 (0.2)	5 (0.5)	36 (1.3)	82 (0.9)	18 (0.9)
Black	15 (0.1)	0 (0.3)	5 (0.7)	34 (2.9)	66 (2.9)
Hispanic	11 (0.1)	1 (0.5)	10 (1.2)	50 (3.6)	50 (3.6)
Asian	2 (0.1)	8 (3.6)	40 (3.9)	79 (4.3)	21 (4.3)
Pacific Islander	1 (0.4) !	3 (3.1) !	15 (4.6) !	63 (10.6) !	37 (10.6) !
American Indian	2 (0.4) !	2 (1.3) !	15 (3.6) !	59 (5.1) !	41 (5.1) !
Grade 12					
Nation	100	2 (0.5)	27 (1.2)	70 (0.9)	30 (0.9)
Race/Ethnicity					
White	74 (0.3)	2 (0.6)	33 (1.5)	78 (0.9)	22 (0.9)
Black	12 (0.4)	0 (0.1)	5 (1.0)	32 (2.3)	68 (2.3)
Hispanic	8 (0.2)	0 (0.2)	10 (1.8)	48 (2.8)	52 (2.8)
Asian	3 (0.2)	3 (1.6)	32 (5.7)	69 (3.9)	31 (3.9)
Pacific Islander	1 (0.3) !	1 (1.3) !	19 (4.4) !	69 (5.1) !	31 (5.1) !
American Indian	1 (0.2) !	***	***	***	***

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding or, in the case of the race/ethnicity variable, because some students categorized themselves as "other."

The estimates of population percentages reported as zero (and standard errors reported as 0.0) are actually nonzero, but rounded to zero when reporting to the nearest integer (or nearest tenth in the case of the standard errors).

! Interpret with caution any comparisons involving this statistic. The nature of the sample does not allow for accurate determination of the variability of this value.

*** Sample size insufficient to permit a reliable estimate (see Appendix A).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

At grade 4, the percentages of White students who attained each of the three achievement levels were higher than the percentages for Black and Hispanic students. Furthermore, higher percentages of White students reached the *Basic* and *Proficient* levels than did American Indian students. Higher percentages of Asian students than Black and Hispanic students reached the *Basic* and *Proficient* levels. Also, the percentage of Asian students at or above the *Proficient* level was higher than that of American Indian students. The percentage of Pacific Islander students who reached the *Basic* level was higher than that of Black and Hispanic students. The percentages of Hispanic and American Indian students who reached the *Basic* level were higher than the percentage of Black students. Finally, a higher percentage of Hispanic students than Black students reached the *Proficient* level.

At grade 8, the pattern shown at grade 4 was largely repeated. However, the sample at grade 8 does not allow for accurate determination of the standard errors associated with the percentages for Pacific Islander and American Indian students. Therefore, these groups cannot be compared with other groups at this grade.

At grade 12, fewer significant differences existed across the racial/ethnic subgroups than at the other grades. For example, there were no significant differences among racial/ethnic subgroups in the percentages of students reaching the *Advanced* level. The percentages of White and Asian students who reached the *Basic* and *Proficient* levels were higher than those for Black and Hispanic students. Finally, a lower percentage of Black students than Hispanic students reached the *Basic* level. As at grade 8, Pacific Islander and American Indian students are not included in group comparisons at grade 12 because of sample limitations.

When considering these data, readers should keep in mind the cautions about interpreting group differences discussed in Chapter 1. A further reason for caution is that, while the percentages of White students scoring at the *Advanced* level were larger (in a statistically significant sense) than the percentages of Black or Hispanic students at grades 4 and 8, the practical importance of these differences may be limited by the small numbers of students reaching the *Advanced* level.

Gender. Table 3.3 presents achievement level results for male and female students. At grades 4 and 8, the significant gender differences observed in average scale scores were also observed in the percentages of students reaching the *Proficient* and *Advanced* achievement levels. For example, the percentages of male students at or above the *Proficient* level (26 percent at grade 4 and 30 percent at grade 8) were significantly higher than the percentages for female students (19 and 25 percent, respectively).

At grade 12, the achievement level results also showed a significant gender difference, with male students outperforming their female peers. The percentages of male twelfth graders at or above the *Basic* and *Proficient* achievement levels were higher than the percentages of female students. Nearly three-quarters (73 percent) of male high school seniors reached the *Basic* level, compared with two-thirds (67 percent) of female high school seniors.

TABLE 3.3

Geography Achievement Levels by Gender Grades 4, 8, and 12

		Percentage of Students			
	Percentage of Students	At Advanced	At or Above Proficient	At or Above Basic	Below Basic
Grade 4					
Nation	100	3 (0.4)	22 (1.2)	70 (1.1)	30 (1.1)
Gender					
Male	51 (1.0)	4 (0.7)	26 (1.7)	71 (1.3)	29 (1.3)
Female	49 (1.0)	2 (0.5)	19 (1.3)	68 (1.4)	32 (1.4)
Grade 8					
Nation	100	4 (0.4)	28 (1.0)	71 (1.0)	29 (1.0)
Gender					
Male	51 (0.7)	5 (0.6)	30 (1.2)	72 (1.3)	28 (1.3)
Female	49 (0.7)	3 (0.4)	25 (1.1)	69 (1.1)	31 (1.1)
Grade 12					
Nation	100	2 (0.5)	27 (1.2)	70 (0.9)	30 (0.9)
Gender					
Male	50 (1.0)	2 (0.7)	32 (1.4)	73 (1.1)	27 (1.1)
Female	50 (1.0)	1 (0.4)	22 (1.4)	67 (1.2)	33 (1.2)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

***Parents' Highest Level of Education*.** As shown in Table 3.4, a positive relationship exists between level of parents' education and the percentages of students at or above the three achievement levels. In general, the higher the level of education reported, the higher the percentages of students at each achievement level.

At all three grades, a higher percentage of students who reported that at least one parent had graduated from college reached the *Advanced* level than did those reporting that at least one parent had graduated from high school. In addition, at grade 8, a higher percentage of students who reported that at least one parent had

TABLE 3.4

Geography Achievement Levels by Parents' Highest Level of Education Grades 4, 8, and 12

		Percentage of Students			
	Percentage of Students	At Advanced	At or Above Proficient	At or Above Basic	Below Basic
Grade 4					
Nation	100	3 (0.4)	22 (1.2)	70 (1.1)	30 (1.1)
Parents' Education Level					
Graduated College	42 (1.0)	5 (0.9)	31 (2.0)	78 (1.5)	22 (1.5)
Some Education After High School	7 (0.4)	3 (1.1)	30 (3.4)	80 (2.3)	20 (2.3)
Graduated High School	12 (0.6)	1 (0.6)	15 (2.1)	63 (2.9)	37 (2.9)
Did Not Finish High School	4 (0.4)	0 (0.0)	8 (3.3)	52 (5.2)	48 (5.2)
I Don't Know	34 (0.9)	1 (0.4)	14 (1.1)	63 (1.4)	37 (1.4)
Grade 8					
Nation	100	4 (0.4)	28 (1.0)	71 (1.0)	29 (1.0)
Parents' Education Level					
Graduated College	42 (1.2)	7 (0.7)	41 (1.4)	82 (1.2)	18 (1.2)
Some Education After High School	19 (0.7)	3 (0.8)	29 (2.3)	79 (1.3)	21 (1.3)
Graduated High School	22 (0.9)	1 (0.6)	15 (1.5)	62 (2.0)	38 (2.0)
Did Not Finish High School	7 (0.5)	1 (0.5)	8 (1.6)	47 (3.4)	53 (3.4)
I Don't Know	10 (0.5)	1 (0.4)	8 (1.5)	44 (2.9)	56 (2.9)
Grade 12					
Nation	100	2 (0.5)	27 (1.2)	70 (0.9)	30 (0.9)
Parents' Education Level					
Graduated College	44 (1.2)	3 (0.8)	40 (1.6)	81 (1.1)	19 (1.1)
Some Education After High School	25 (0.7)	1 (0.7)	24 (1.8)	75 (1.5)	25 (1.5)
Graduated High School	22 (0.8)	0 (0.3)	14 (1.6)	56 (2.0)	44 (2.0)
Did Not Finish High School	7 (0.4)	0 (0.0)	7 (2.0)	41 (2.9)	59 (2.9)
I Don't Know	3 (0.2)	0 (0.0)	7 (1.6)	36 (4.4)	64 (4.4)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

The estimates of population percentages reported as zero (and standard errors reported as 0.0) are actually nonzero, but rounded to zero when reporting to the nearest integer (or nearest tenth in the case of the standard errors).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

graduated from college reached the *Advanced* level than did those reporting all other levels of parental education.

At the *Proficient* and *Basic* levels, the patterns were similar. At grade 4, higher percentages of students who reported that at least one parent graduated from college or had some education after high school reached the *Basic* and *Proficient* levels than did those reporting that their parents had a high school or lower level of education. (At grade 4, the percentage of students reaching the *Proficient* and *Basic* levels were not significantly different for the groups of students reporting the two higher education levels or for the groups reporting the two lower education levels.)

At grades 8 and 12, higher percentages of students reporting that their parents had achieved a given level of education reached the *Basic* and *Proficient* achievement levels than did those reporting lower levels of parental education. For example, at grade 12, higher percentages of students who reported that at least one parent graduated from college scored at or above the *Basic* and *Proficient* levels than did students who reported that at least one parent had some education after high school. Higher percentages of the latter group scored at or above the *Basic* and *Proficient* levels than did students who reported at least one parent graduated from high school; these students, in turn, showed higher achievement than those who reported that neither parent had finished high school. The exception to this rule was at grade 8, where there were no significant differences in the percentages of students at or above the *Basic* level who reported that at least one parent graduated from college and those who reported that at least one parent had some education after high school.

One-third of fourth graders and one-tenth of eighth graders did not know their parents' level of education. In addition, as noted previously, the accuracy of student self-reported data may be open to some question. Nonetheless, the positive relationship between parental education and achievement in geography remains striking.

Type of Location. Table 3.5 presents achievement level results by type of location. Type of location categories indicate the location of students' schools and are not intended to indicate or imply social and economic meanings. (The type of location classifications are described in Appendix A.)

At all three grades, no statistically significant differences existed among percentages of students attending schools in different types of location who attained the *Advanced* level. At grades 4 and 8, higher percentages of students attending schools in urban fringe/large town locations than students in central city locations reached the *Proficient* level. At grades 4 and 8, higher percentages of students attending schools in urban fringe/large town and rural/small town locations than students in central city locations reached the *Basic* level.

At grade 12, a higher percentage of students attending schools in urban fringe/large town locations than those in rural/small town locations reached the *Proficient* level. Finally, the percentage of urban fringe/large town students who reached the *Basic* level was higher than the percentages of students in other types of location.

TABLE 3.5

Geography Achievement Levels by Type of Location Grades 4, 8, and 12

		Percentage of Students			
	Percentage of Students	**At Advanced**	**At or Above Proficient**	**At or Above Basic**	**Below Basic**
Grade 4					
Nation	100	3 (0.4)	22 (1.2)	70 (1.1)	30 (1.1)
Type of Location					
Central City	35 (2.1)	2 (0.5)	18 (1.6)	61 (2.1)	39 (2.1)
Urban Fringe/Large Town	43 (2.4)	3 (0.8)	26 (2.0)	76 (1.7)	24 (1.7)
Rural/Small Town	22 (2.2)	3 (0.7)	21 (2.6)	71 (2.3)	29 (2.3)
Grade 8					
Nation	100	4 (0.4)	28 (1.0)	71 (1.0)	29 (1.0)
Type of Location					
Central City	36 (2.4)	4 (0.6)	24 (1.3)	64 (2.2)	36 (2.2)
Urban Fringe/Large Town	38 (2.9)	4 (0.6)	31 (1.5)	76 (1.6)	24 (1.6)
Rural/Small Town	26 (1.9)	4 (0.5)	28 (2.2)	73 (2.3)	27 (2.3)
Grade 12					
Nation	100	2 (0.5)	27 (1.2)	70 (0.9)	30 (0.9)
Type of Location					
Central City	31 (2.3)	2 (0.6)	25 (1.7)	66 (1.8)	34 (1.8)
Urban Fringe/Large Town	42 (2.8)	2 (0.8)	31 (2.2)	74 (1.5)	26 (1.5)
Rural/Small Town	26 (1.9)	1 (0.5)	22 (1.8)	68 (1.8)	32 (1.8)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Title I Participation. Table 3.6 provides achievement level results by Title I status. Compared with their counterparts who did not receive Title I services, lower percentages of fourth-grade Title I recipients performed at or above the *Basic* and *Proficient* achievement levels. Significantly lower percentages of eighth-grade students who received Title I services performed at or above each of the achievement levels when compared with their counterparts who did not receive Title I services. The percentages of Title I students who performed below *Basic* were 71 percent at grade 4 and 62 percent at grac 8. Conversely, between 24 and 27 percent of students who did not receive Title I services performed below th *Basic* level. Grade 12 differences are not discussed here because the nature of the grade 12 sample does not allow for accurate estimation of the variability of the percentages for Title I recipients.

TABLE 3.6

Geography Achievement Levels by Title I Participation
Grades 4, 8, and 12

		Percentage of Students			
		At Advanced	At or Above Proficient	At or Above Basic	Below Basic
Grade 4					
Nation	100	3 (0.4)	22 (1.2)	70 (1.1)	30 (1.1)
Title I Participation					
Yes	13 (1.3)	0 (0.0)	2 (0.9)	29 (3.0)	71 (3.0)
No	87 (1.3)	3 (0.5)	25 (1.4)	76 (1.2)	24 (1.2)
Grade 8					
Nation	100	4 (0.4)	28 (1.0)	71 (1.0)	29 (1.0)
Title I Participation					
Yes	7 (1.0)	0 (0.6)	6 (1.8)	38 (4.3)	62 (4.3)
No	93 (1.0)	4 (0.4)	29 (1.0)	73 (1.0)	27 (1.0)
Grade 12					
Nation	100	2 (0.5)	27 (1.2)	70 (0.9)	30 (0.9)
Title I Participation					
Yes	2 (0.5) !	0 (0.0) !	3 (1.2) !	24 (2.8) !	76 (2.8) !
No	98 (0.5)	2 (0.5)	27 (1.2)	71 (0.9)	29 (0.9)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

The estimates of population percentages reported as zero (and standard errors reported as 0.0) are actually nonzero, but rounded to zero when reporting to the nearest integer (or nearest tenth in the case of the standard errors).

! Interpret with caution any comparisons involving this statistic. The nature of the sample does not allow for accurate determination of the variability of this value.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Type of School. Table 3.7 presents results for public and nonpublic schools. At each grade, the percentages of nonpublic school students who reached both the *Basic* and *Proficient* levels were significantly higher than the percentages of students attending public schools. At the eighth grade, a higher percentage of nonpublic school students reached the *Advanced* level.

As noted in Chapter 1, the reader is cautioned against making causal inferences about the relative effectiveness of public and nonpublic schools. Achievement level differences between the two types of schools are, in part, related to socioeconomic and sociological factors, such as levels of parental involvement in their child's education. To get a clearer picture of the differences between public and nonpublic schools, more in-depth analyses are required.

TABLE 3.7

Geography Achievement Levels by Type of School Grades 4, 8, and 12

		Percentage of Students			
	Percentage of Students	**At Advanced**	**At or Above Proficient**	**At or Above Basic**	**Below Basic**
Grade 4					
Nation	100	3 (0.4)	22 (1.2)	70 (1.1)	30 (1.1)
Type of School					
Public Schools	90 (0.8)	3 (0.5)	21 (1.3)	68 (1.2)	32 (1.2)
All Nonpublic Schools	10 (0.8)	5 (1.2)	30 (2.5)	84 (2.2)	16 (2.2)
Catholic Schools	6 (0.7)	5 (1.9)	30 (3.0)	85 (2.8)	15 (2.8)
Other Nonpublic Schools	4 (0.5)	4 (1.2)	30 (4.1)	82 (3.5)	18 (3.5)
Grade 8					
Nation	100	4 (0.4)	28 (1.0)	71 (1.0)	29 (1.0)
Type of School					
Public Schools	90 (0.8)	4 (0.4)	26 (1.0)	69 (1.0)	31 (1.0)
All Nonpublic Schools	10 (0.8)	8 (1.4)	44 (2.2)	87 (1.7)	13 (1.7)
Catholic Schools	6 (0.6)	8 (1.6)	44 (2.6)	89 (1.8)	11 (1.8)
Other Nonpublic Schools	4 (0.6)	7 (2.0)	45 (4.8)	86 (3.2)	14 (3.2)
Grade 12					
Nation	100	2 (0.5)	27 (1.2)	70 (0.9)	30 (0.9)
Type of School					
Public Schools	89 (1.0)	1 (0.5)	26 (1.3)	68 (1.0)	32 (1.0)
All Nonpublic Schools	11 (1.0)	3 (0.7)	36 (2.3)	83 (2.2)	17 (2.2)
Catholic Schools	6 (0.9)	1 (0.5)	33 (3.8)	80 (3.9)	20 (3.9)
Other Nonpublic Schools	4 (0.6)	5 (1.5)	40 (3.1)	87 (2.4)	13 (2.4)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages for students in the two types of nonpublic schools may not total the percentage in nonpublic schools only due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Summary

For the most part, performances of reporting subgroups reflected patterns of average scale scores noted in Chapter 2 of this report.

- For the nation as a whole, approximately 70 percent of students reached the *Basic* level, while approximately one-quarter reached the *Proficient* level.
- Higher percentages of White and Asian students reached the *Basic* and *Proficient* levels than did Black and Hispanic students, at all three grades.
- At grades 4, 8, and 12, the percentages of male students who reached the *Proficient* level were higher than those of female students.
- Generally, the higher the level of parental educatio the greater the percentages of students reaching a given achievement level.
- Similarly, higher percentages of students attendin nonpublic schools at all three grades reached the *Basic* and *Proficient* levels than did those attendin public schools. At grade 8, a higher percentage of students attending nonpublic schools also reached the *Advanced* level than did their peers who were attending public schools.

CHAPTER 4

Contexts in Which Students Learn Geography

Geography learning takes many forms. Teachers of geography employ a variety of teaching strategies and use different geography tools, such as maps, globes, and computers, to enhance geography learning. Outside of the classroom, exposure to different media and home support for schooling can also promote a rich geography education.[1]

Previous chapters in this report have examined what students know and can do in geography. In this chapter, some of the contexts in which geography learning takes place are examined, to provide a background for understanding student performance.

The Extent of Students' Social Studies and Geography Instruction

As part of the NAEP 1994 geography assessment, students were asked a series of questions concerning the amount of geography instruction they had received. In addition, information concerning social studies or geography instruction was collected from the teachers of fourth-grade students participating in the assessment.[2] The results illustrate the nature of geography instruction in the nation's schools.

Social Studies and Geography Instruction at Grade 4. The NAEP 1994 geography framework that served as the blueprint for the assessment stated that most fourth graders will receive some geography education as part of their social studies classes, instead of specific classes in geography. Approximately three-quarters (72 percent) of fourth graders reported having a social studies class at least three times a week. Only 6 percent reported never or hardly ever having such classes. Table 4.1 shows the percentages of students and average scale scores according to the frequency with which students reported taking social studies classes.

The frequency of social studies classes is positively related to fourth graders' performance on the NAEP geography assessment. Students who reported having social studies class every day or three to four times a week had higher average scores than those who report having such classes less frequently or never. In additio students who reported having classes once or twice a week outperformed those who reported never or hardly ever taking a social studies class.

TABLE 4.1

Students' Reports on Social Studies Course Taking Grade 4

	Percentage	Average Scale Score
How Often Do You Usually Have Social Studies Class in School?		
Almost Every Day	45 (1.9)	208 (1.6)
3-4 Times a Week	27 (1.1)	213 (2.1)
1-2 Times a Week	17 (1.0)	201 (1.9)
Less Than 1 Time a Week	5 (0.4)	189 (4.7)
Never or Hardly Ever	6 (0.7)	186 (4.4)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Teachers of fourth graders were asked how much time they spent on geography in their social studies classes. Table 4.2 shows that teachers of 39 percent of fourth-grade students reported spending 60 minutes or more per week on geography, while teachers of 44 percent of fourth graders reported spending 30 minutes or less per week on geography. No significant differences in average scores were evident among students from classes with different amounts of time spent on geography.

TABLE 4.2

Teachers' Reports on Time Spent Per Week in Social Studies Class on Geography Teaching Grade 4

	Percentage of Students	Average Scale Score
90 Minutes or More	22 (2.1)	209 (2.8)
60 Minutes	17 (2.0)	206 (3.0)
45 Minutes	17 (1.6)	208 (3.3)
30 Minutes or Less	44 (2.6)	206 (1.9)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

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Examined together, the results of the NAEP questions concerning fourth-grade students' in-school exposure to geography indicated:

- The majority of fourth graders reported taking social studies classes.
- Frequent social studies classes are positively related to scores on the NAEP geography assessment, although teachers of 44 percent of fourth graders reported spending 30 minutes or less per week on geography.

Geography Course Taking at Grades 8 and 12. Eighth and twelfth graders were asked whether they had previously taken or were currently taking a geography course. In addition, eighth graders were asked whether they had taken an earth science course, and twelfth graders whether they had taken courses in world geography and United States geography.

Table 4.3 presents the results of these questions. Fifty-three percent of eighth graders indicated that they were currently taking a geography course, and 69 percent indicated that they had taken at least one geography course since the sixth grade. Seventy-three percent of eighth graders also reported that they had taken an earth science course.

The relationship between course taking and geography performance at grade 8 indicates that students who reported taking at least one geography course scored significantly higher than students who reported not taking any geography courses. (Thirteen percent of eighth graders reported not knowing whether they had taken a geography course in the past.) Furthermore, students who reported taking an earth science course (which covers content similar to physical geography) outperformed students who reported that they had not taken such a course. (There was no significant difference between eighth graders who reported they were currently taking a geography course and those who were not.)

The majority of twelfth graders (79 percent) reported that they were not currently taking a geography course. These students, on average, outperformed the 15 percent of the twelfth graders who reported they were currently enrolled in a geography course. (Again, some twelfth graders reported not knowing whether they were currently taking a geography course.) At the twelfth grade, the 66 percent of students who reported taking at least one geography course since the ninth grade did not differ significantly in performance from the 31 percent who reported not taking geography.

TABLE 4.3

Students' Reports on Geography Course Taking Grades 8 and 12

	Percentage	Average Scale Score
Grade 8		
Currently Taking a Geography Course		
Yes	53 (1.1)	263 (0.8)
No	29 (1.0)	264 (1.2)
I don't know	18 (0.7)	247 (1.3)
Has Taken at Least One Geography Course Since the 6th Grade		
Yes	69 (1.1)	266 (0.7)
No	18 (1.0)	250 (1.6)
I don't know	13 (0.6)	243 (1.5)
Taken an Earth Science Course		
Yes	73 (2.0)	263 (0.8)
No	27 (2.0)	252 (1.5)
Grade 12		
Currently Taking a Geography Course		
Yes	15 (0.7)	277 (1.5)
No	79 (0.8)	288 (0.8)
I don't know	6 (0.4)	271 (1.9)
Has Taken at Least One Geography Course Since the 9th Grade		
Yes	66 (1.7)	285 (0.8)
No	31 (1.6)	286 (1.4)
I don't know	3 (0.4)	268 (2.1)
Taken a Course in World Geography		
Yes	62 (1.7)	287 (0.9)
No	38 (1.7)	282 (1.3)
Taken a Course in U.S. Geography		
Yes	46 (1.2)	285 (1.0)
No	54 (1.2)	285 (0.9)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

One explanation for this the significant difference between those who are currently enrolled in a geography course and those who are not is that students enrolled in a geography course in the twelfth grade are not following course-taking patterns typical of most of their peers. This difference in course-taking patterns may indicate other academic differences between the two groups. However, twelfth graders who reported taking a course in world geography outperformed those students who had not. There were no significant differences between students who reported taking a course in United States geography and those who had not.

Perhaps more consistent with the grade 12 performance for students who reported taking world geography, Table 4.4 shows that a positive relationship exists between the numbers of semesters of potential geography-related course work completed by twelfth graders and their average scale scores. The results show that as the number of semesters of geography-related course work increases, average scale scores also increase.

TABLE 4.4

Students' Reports on Number of Semesters of History, Geography, or Social Studies Taken Grade 12

Number of Semesters	Percentage	Average Scale Score
None	1 (0.1)	***
1 or 2	7 (0.6)	264 (1.7)
3 or 4	29 (1.1)	275 (1.2)
5 or 6	30 (1.2)	294 (1.1)
7 or More	34 (1.9)	298 (1.1)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

*** Sample size insufficient to permit a reliable estimate (see Appendix A).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Geography Course Taking Within Subgroups at Grades 8 and 12. Chapter 2 discussed significant differences at grades 8 and 12 among various subgrour including males and females, racial/ethnic groups, and students attending public and nonpublic schools. One possible explanation for such differences could be variations in course-taking patterns that are measures of exposure to geography instruction. Tables 4.5 and 4. present results for selected course-taking variables.

At grade 8, no significant differences in course taking were observed between male and female student The percentage of White students who reported taking at least one geography course since the sixth grade was significantly higher than the percentages for Black and Hispanic students (see Table 4.5). Also, the percentages of students attending nonpublic schools who reported taking at least one geography course and who reported taking an earth science course were greater than the percentages of their peers attending public schools.

TABLE 4.5

Students' Reports on Geography Course Taking for Selected Subgroups Grade 8

	Percentage of Students Who Reported Taking . . .	
	At Least One Geography Course Since the 6th Grade	An Earth Science Course
Gender		
Male	68 (1.2)	73 (2.2)
Female	70 (1.4)	73 (2.1)
Race/Ethnicity		
White	72 (1.4)	75 (2.4)
Black	63 (2.0)	70 (2.6)
Hispanic	60 (3.3)	67 (2.5)
Asian	73 (5.1)	74 (4.8)
Pacific Islander	68 (3.4) !	72 (6.1) !
American Indian	67 (3.4) !	78 (4.1) !
Type of School		
Public	69 (1.2)	72 (2.3)
Nonpublic	76 (2.1)	80 (2.2)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

! Interpret with caution any comparisons involving this statistic. The nature of the sample does not allow for accurate determination of the variability of this value.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

At grade 12, the only significant difference between male and female students was that more male students than female students reported taking a United States geography course. The percentage of Black students who reported taking at least one geography course was significantly higher than the percentage for Hispanic students (see Table 4.6). Also, the percentage of White students who reported taking a world geography course was significantly higher than the percentage of Hispanic students. The percentage of students attending public schools who reported taking at least one geography course in high school was larger than the percentage for students attending nonpublic schools.

TABLE 4.6

Students' Reports on Geography Course Taking for Selected Subgroups Grade 12

THE NATION'S REPORT CARD 1994 Geography Assessment

	Percentage of Students Who Reported Taking . . .		
	At Least One Geography Course Since 9th Grade	A Course in World Geography	A Course in U.S. Geography
Gender			
Male	67 (1.7)	64 (1.7)	49 (1.2)
Female	64 (1.9)	60 (2.0)	42 (1.6)
Race/Ethnicity			
White	66 (2.0)	64 (2.0)	47 (1.5)
Black	70 (2.6)	63 (2.8)	43 (2.1)
Hispanic	57 (3.2)	53 (2.7)	39 (2.7)
Asian	63 (4.0)	56 (4.1)	35 (4.7)
Pacific Islander	58 (4.5) !	50 (5.1) !	36 (4.8) !
American Indian	***	***	***
Type of School			
Public	67 (1.8)	63 (1.8)	46 (1.3)
Nonpublic	58 (3.4)	59 (3.1)	47 (2.1)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

! Interpret with caution any comparisons involving this statistic. The nature of the sample does not allow for accurate determination of the variability of this value.

*** Sample size insufficient to permit a reliable estimate (see Appendix A).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Differences in course-taking behaviors is only one possible explanation for differences in student performance on the NAEP geography assessment. Many other variables could explain the observed score differences. Moreover, not all of the significant group differences discussed in Chapter 2 were accompanied by corresponding differences in course-taking behaviors (e.g., gender differences at grades 8 and 12). Hence, the reader is cautioned against making causal inferences in regard to the relationship between course taking and performance on the NAEP geography assessment. Nevertheless, the breadth of the NAEP geography data affords other researchers the opportunity to explore these and other factors and their relationships to geography achievement.

Teacher Background and Experience

Given the current interest (discussed in Chapter 1) in making geography learning a substantive part of educational curricula, it is useful to explore the educational backgrounds and experiences that teachers of students in grades 4 and 8 bring to their geography lessons. As part of the NAEP assessment, teachers were asked a series of questions about their educational backgrounds. Teachers of assessed students in grades 4 and 8 were asked about their undergraduate and graduate fields of study and about the kinds of continuing education they had pursued. (Fourth- and eighth-grade teachers were asked to indicate **all** undergraduate and graduate majors that applied. Therefore, some teachers indicated two or more majors, so that the percentages in Tables 4.7 and 4.8 sum to more than 100.)

TABLE 4.7

Teachers' Reports on Undergraduate Majors Grades 4 and 8

THE NATION'S REPORT CARD 1994 Geography Assessment

	Grade 4	Grade 8
	Percentage of Students	Percentage of Students
Teachers' Undergraduate Major		
Geography	2 (0.5)	9 (1.5)
Education	80 (2.1)	46 (2.6)
History	10 (1.1)	47 (2.6)
Social Studies Education	8 (1.2)	42 (3.0)
Other	33 (2.4)	37 (3.2)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

The percentages of students whose teachers reported particular undergraduate majors do not total 100 since teachers were asked to indicate all appropriate majors. In addition, grade 4 teachers also were asked to indicate English and Reading and/or Language Arts majors.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

The results suggest that teachers of eighth graders may have more subject-specific backgrounds, while teachers of fourth graders are more likely to have backgrounds specializing in education. It should be noted that the organization of fourth- and eighth-grade classes also differs. According to school administrators, 56 percent of fourth graders attend schools where the fourth-grade classrooms are described as self-contained (students have the same teacher for all academic subjects). At grade 8, the majority of students (85 percent) attend schools where the organization of eighth-grade classes is described as departmentalized (students having different teachers for most or all academic subjects). The difference in classroom organization may explain the differences in teachers' educational backgrounds. Table 4.7 shows teachers of most fourth-grade students (80 percent) reported having majored in education at the undergraduate level, while teachers of 46 percent of eighth graders reported a major in education. However, teachers of approximately half of eighth-grade students reported having an undergraduate degree in either history or a social studies education. Few students at either grade had teachers who reported a major in geography (2 percent at grade 4 and 9 percent at grade 8).

Similarly, at the graduate level (Table 4.8), teachers of the majority (59 percent) of fourth graders reported having a graduate degree in education, while few fourth graders had teachers who reported having graduate degrees in either geography, history, or social studies education. Teachers of 47 percent of eighth-grade students had degrees in education. Noticeably more eighth graders had teachers who reported graduate majors in history and/or social studies education. Again, few students at either grade had teachers who reported a graduate major in geography. (About 20 percent of both fourth and eighth graders had teachers who reported other graduate majors, and approximately another 20 percent reported no graduate study.)

Table 4.9 shows continuing education activities. Results indicate that eighth graders had teachers who attended somewhat more workshops or seminars than did teachers of grade 4. At grade 4, teachers of 35 percent of students reported participating in no continuing education activities in subjects related to social studies, history, or geography compared with 18 percent at grade 8. Twenty-four percent of grade 4 students had teachers who reported spending at least 6 hours in workshops or seminars, compared with 54 percent at grade 8.

TABLE 4.8

Teachers' Reports on Graduate Majors Grades 4 and 8

	Grade 4	Grade 8
	Percentage of Students	Percentage of Students
Teachers' Graduate Major		
Geography	1 (0.8)	4 (1.0)
Education	59 (2.5)	47 (2.5)
History	2 (0.7)	23 (2.1)
Social Studies Education	3 (1.1)	20 (2.5)
Other	19 (1.7)	23 (2.3)
No Graduate Study	22 (2.0)	18 (2.3)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

The percentage of students whose teachers reported particular graduate majors do not total 100 since teachers were asked to indicate all appropriate majors.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

TABLE 4.9

Teachers' Reports on Continuing Education Grades 4 and 8

	Grade 4	Grade 8
	Percentage of Students	Percentage of Students
Amount of Continuing Education Reported by Teachers*		
None	35 (2.4)	18 (2.6)
Less Than 6 Hours	41 (2.4)	29 (2.8)
6-15 Hours	16 (1.7)	28 (2.0)
16-35 Hours	4 (0.7)	15 (1.7)
More Than 35 Hours	4 (0.9)	11 (1.5)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

*Total time spent in staff development workshops or seminars in social studies or the teaching of social studies, U.S. history, or geography during the last year.

Percentage of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

The Context for Learning Geography at Grades 4 and 8

Activities in school, family support for students' educational efforts, and student motivation create the context in which academic learning takes place. Hence this section contains contextual information related to instructional activities in, home support for, and student interest in geography learning. Because of the small percentage of twelfth graders currently taking a geography course (15 percent), grade 12 students' reports of instructional activities related to geography are not presented. (The small percentage of twelfth graders who reported currently taking a geography course may be due to school requirements for the subject. Sixty-six percent of grade 12 students attended schools that reported having no geography requirement for graduation.[3]) Teachers' reports of instructional activities for eighth graders are not presented because of limitations of the data (see Endnote 2).

Instructional Materials and Practices

Teachers use a range of instructional materials and practices in their classrooms. Studies have shown that incorporating a variety of teaching methods and materials can help engage students with different learning styles.[4] Moreover, the many applications of geographic knowledge, and the varieties of subject matter included in geography learning, make the use of different materials and teaching practices especially important.[5] In addition to standard textbooks, teachers may use maps and globes, special projects, and computers as part of their instruction.

As presented in the following discussion, some discrepancies exist between student- and teacher-reported frequencies for some of the instructional materials and practices examined. It is not possible to offer conclusive reasons for these discrepancies or to determine which report most accurately reflects fourth-grade classroom activities. The reports presented represent students' and teachers' impressions of the frequency of various activities in their classrooms.

Instructional materials and strategies may be chosen for a variety of purposes. Consequently, the relationships between frequency of use of various materials and practices and scores on the NAEP geography assessment cannot be interpreted in a causal fashion. The design of the assessment does not allow for the evaluation of the effectiveness of different strategies. The initial ability of the students, the particular topics being taught, and the complexity of the subject matter all need to be controlled before cause-and-effect statements can be made, and such experimental methods were not possible in a large-scale assessment.

The Use of Maps and Globes in Learning Geography. Many of the geography skills that students are expected to master involve the use of special tools and materials.[6] Maps and globes are the primary tools of geography because they assist in the visualization of space and can be used to communicate complex social and physical data.[7] As part of the NAEP 1994 geography assessment, students in grades 4 and 8 and teachers of fourth-grade students were asked about the frequency of using maps and globes in school. Tables 4.10 and 4.11 present teachers' and students' reports on the use of maps and globes in geography instruction.

Table 4.10 shows that fourth-grade teachers reported higher frequencies of use of maps and globes than did their students. Teachers of 83 percent of fourth graders reported use of these tools at least once or twice a week. Teachers of only one percent of fourth graders reported never using maps and globes in class. The grade 4 students who had teachers reporting daily and weekly use of maps and globes outperformed students who had teachers reporting monthly use.

TABLE 4.10

Teachers' Reports on Use of Maps and Globes Grade 4

	Grade 4	
	Percentage of Students	Average Scale Score
Almost Every Day	29 (2.3)	210 (2.1)
Once or Twice a Week	54 (2.5)	209 (1.7)
Once or Twice a Month	17 (2.1)	199 (3.2)
Never	1 (0.3)	***

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

*** Sample size insufficient to permit a reliable estimate (see Appendix A).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

As Table 4.11 shows, 50 percent of fourth graders and 39 percent of eighth graders reported using maps and globes at least once or twice a week. Twenty-seven percent of fourth graders and 28 percent of eighth graders reported never using maps and globes.

Students in grade 4 who reported using maps and globes once or twice a month outperformed students reporting use more frequently, and students reporting use once or twice a week outperformed students reporting use almost every day. Students reporting use once or twice a week or once or twice a month outperformed students who reported never using maps and globes at grade 4. Furthermore, at grade 8, students who reported any use outperformed students reporting no use.

TABLE 4.11

Students' Reports on Use of Maps and Globes Grades 4 and 8

	Grade 4	Grade 8
	Percentage and Average Scale Score	Percentage and Average Scale Score
Almost Every Day	18 (0.9) 202 (2.1)	9 (0.6) 261 (1.7)
Once or Twice a Week	32 (0.8) 211 (1.5)	30 (0.9) 264 (1.1)
Once or Twice a Month	23 (0.8) 217 (1.7)	33 (0.9) 263 (1.1)
Never	27 (1.0) 201 (1.7)	28 (1.0) 253 (1.0)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

The Use of Projects in Learning Geography. Geography projects can help students learn to acquire information from primary and secondary sources and to analyze, synthesize, and evaluate geographic information, all important skills discussed in the NAEP 1994 geography framework.[8] Tables 4.12 and 4.13 show the percentages and average scale scores for teachers' and students' reports of doing projects related to geography study. Table 4.12 shows that at the fourth grade, teacher-reported frequencies of never using projects are relatively consistent with student-reported frequencies. Teachers of 82 percent of fourth graders reported having students do projects related to geography at least sometimes. Teachers of 18 percent of fourth graders reported never having students do such projects. There were no significant differences in student performance by frequency of using projects.

TABLE 4.12

Teachers' Reports on Use of Geography Projects Grade 4

	Grade 4	
	Percentage of Students	Average Scale Score
Often	8 (1.5)	214 (4.8)
Sometimes	74 (2.3)	206 (1.8)
Never	18 (2.2)	205 (2.4)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

As Table 4.13 indicates, 78 percent of fourth graders and 69 percent of eight graders reported doing geography projects at least sometimes. Twenty-three percent of fourth graders and 31 percent of eighth graders reported never doing such projects.

As with the use of maps and globes (see Table 4.11), there was some relationship between students' reports of doing projects related to geography and geography performance on the assessment. At grade 4, students reporting doing such projects often or sometimes outperformed students who reported never doing such projects; and at grade 8, students reporting doing projects sometimes outperformed students who never did them.

TABLE 4.13

Students' Reports on Doing Geography Projects Grades 4 and 8

	Grade 4	Grade 8
	Percentage and Average Scale Score	Percentage and Average Scale Score
Often	29 (1.1) 211 (1.7)	21 (0.8) 260 (1.1)
Sometimes	49 (0.9) 208 (1.6)	48 (0.8) 262 (0.9)
Never	23 (0.8) 198 (1.8)	31 (1.0) 257 (1.2)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

When reported use of projects for the 53 percent of eighth-graders currently enrolled in a geography course is examined, the picture changes. Table 4.14 shows the results for eighth graders' reports of doing geography projects only for those grade 8 students who reported they were currently taking a geography class. (The eighth-grade results presented in Table 4.13 are for all eighth graders. Reports of geography-related projects by students not currently enrolled in a geography class may be associated with projects assigned in history or social studies classes.) For those eighth-grade students who reported they were currently taking a geography course, the frequencies of doing geography-related reports were similar to those reported by all eighth graders (see Table 4.13). However, unlike the results for all eighth graders that show some relationship between doing geography reports and performance, no significant differences were observed for the subset of students currently taking a geography course.

TABLE 4.14

Students' Reports on Doing Geography Projects for Students Currently Enrolled in a Geography Course Grade 8

	Grade 8	
	Percentage	Average Scale Score
For Grade 8 Students Currently Taking a Geography Course		
Often	27 (1.1)	264 (1.2)
Sometimes	52 (1.0)	264 (1.1)
Never	21 (1.1)	260 (1.7)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

The Use of Computers in Learning Geography. Computers can be an important classroom tool. In geography learning, they have many uses, including developing models of complex geographic relationships and environmental and cultural processes.[9] Tables 4.15 and 4.16 present teachers' and students' reports on the frequency of use of computers for studying geography.

Teacher-reported frequencies of computer use were more or less consistent with student-reported frequencies. Table 4.15 shows that teachers of 42 percent of fourth graders reported using computers at least sometimes. As with student-reported data, teachers of the majority of fourth graders reported never using computers in the teaching of geography.

There was a somewhat different relationship between use of computers and student performance associated with fourth-grade teachers' reports than that associated with student-reported data; grade 4 students who had teachers reporting using computers sometimes outperformed students who had teachers reporting never using computers. (Students whose teachers reported using computers sometimes also outperformed those whose teachers reported using computers often.)

TABLE 4.15

Teachers' Reports on Use of Computers Grade 4

	Grade 4	
	Percentage of Students	Average Scale Score
Often	3 (1.4)	194 (6.0)
Sometimes	39 (2.0)	212 (2.1)
Never	58 (2.1)	204 (1.6)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

As Table 4.16 indicate, about 30 percent of both fourth- and eighth-grade students reported using computers at least sometimes for geography study. Mor than two-thirds of students at both grades reported not using computers for geography: 68 percent at grade 4 and 70 percent at grade 8. Fourth-grade students reporting using computers sometimes or never outperformed students reporting using them often. (Also, fourth graders who reported never using a computer outperformed those who reported sometimes using them.) There were no significant differences at grade 8. Again, given the number of variables (such as student ability levels and different uses of computers) that the NAEP geography assessment cannot account for, the reader is asked to avoid inferring simple causal relationships from these results.

TABLE 4.16

Students' Reports on Use of Computers for Geography Grades 4 and 8

	Grade 4	Grade 8
	Percentage and Average Scale Score	Percentage and Average Scale Score
Often	6 (0.4) 186 (3.4)	4 (0.3) 256 (3.1)
Sometimes	26 (1.0) 198 (2.3)	26 (0.9) 262 (1.3)
Never	68 (1.1) 211 (1.2)	70 (1.1) 259 (0.8)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

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The Use of Films, Videos, or Filmstrips in Learning Geography. Audiovisual material can communicate and enhance many kinds of information important to the study of geography. For example, major geographic processes, such as ocean currents and vulcanism, can be vividly illustrated with such materials, as can aspects of life in different cultures and communities. Table 4.17 presents fourth-grade teachers' reports about the frequency of use of these materials for studying geography, and Table 4.18 presents fourth- and eighth-grade students' reports.

As Table 4.17 shows, teachers of most fourth graders (79 percent) reported using films, videos, or filmstrips at least sometimes. The average scale scores for students whose teachers reported some use of these materials was higher than that of students whose teachers reported never using them.

TABLE 4.17

Teachers' Reports on the Use of Films, Videos, or Filmstrips Grade 4

THE NATION'S REPORT CARD 1994 Geography Assessment

	Grade 4	
	Percentage of Students	Average Scale Score
Often	11 (1.6)	213 (3.5)
Sometimes	68 (1.8)	209 (1.8)
Never	21 (2.1)	198 (3.2)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Table 4.18 shows that 65 percent of fourth graders and 69 percent of eighth graders who reported use of audiovisual materials at least sometimes. Approximately one-third of both fourth- and eighth-grade students reported never using such materials, while teachers of only 21 percent of fourth-grade students reported no use.

There was a positive relationship between average scale scores and the use of films, videos, and filmstrips. At both grades 4 and 8, students who reported that these materials were used sometimes outperformed those who reported that these materials were not used, and at grade 8, students who reported that such materials were used often also outperformed those reporting they were not used.

TABLE 4.18

Students' Reports on the Use of Films, Videos, or Filmstrips Grades 4 and 8

THE NATION'S REPORT CARD 1994 Geography Assessment

	Grade 4	Grade 8
	Percentage and Average Scale Score	Percentage and Average Scale Score
Often	17 (0.8) 206 (1.8)	20 (1.0) 262 (1.3)
Sometimes	48 (1.0) 209 (1.7)	49 (1.0) 262 (0.8)
Never	35 (1.1) 203 (1.4)	31 (1.1) 255 (1.2)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

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The Use of Homework in Learning Geography. Teachers frequently reinforce the lessons taught in their classrooms with homework. As part of the NAEP assessment, students at all three grades were asked to indicate the amount of time they usually spend on homework each day. This question was not restricted to social studies or geography homework but referred to homework across all subject areas. Table 4.19 presents the results for fourth, eighth, and twelfth graders. Overall, a positive relationship existed between spending some time on homework and average geography scale scores.

At all grades, between 7 and 14 percent of the students indicated that they did not usually have any homework assigned. For students who indicated that they usually had homework assigned, those reporting that they spent some time on homework significantly outperformed those who reported they did not usually do their homework. (At grade 12, the average scale scores for student who usually don't do homework and those who spend an hour were not significantly different.) At grade 4, the average score for students who reported spending more than one hour on homework each day was significantly less than that for those who reported spending one hour. At grade 8, average scale scores increased with each incremental increase in the time spent on homework. At grade 12, the average scale score for students who reported spending more than one hour on homework each day was significantly higher than that for students who reported spending one hour.

Eighth graders were also asked about how much geography homework they did each week. Table 4.20 presents the results for students who reported that they were currently taking a geography class. Students who reported spending 1 or 2 hours on geography homework performed significantly better than those reporting no time spent on geography homework.

TABLE 4.20

Students' Reports on Time Spent on Geography Homework Each Week Grade 8

For Grade 8 Students Currently Taking a Geography Course	Grade 8	
	Percentage	Average Scale Score
None	30 (1.3)	259 (1.4)
1/2 Hour	34 (1.2)	264 (1.3)
1 Hour	19 (0.8)	265 (1.3)
2 Hours	10 (0.6)	268 (2.0)
More Than 2 Hours	7 (0.6)	266 (2.7)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

TABLE 4.19

Students' Reports on Time Spent on Homework Each Day Grades 4, 8, and 12

	Grade 4	Grade 8	Grade 12
	Percentage and Average Scale Score	Percentage and Average Scale Score	Percentage and Average Scale Score
Don't Usually Have Any	13 (1.2) 211 (2.8)	7 (0.7) 249 (1.9)	14 (0.7) 270 (1.4)
Usually Don't Do It	4 (0.5) 182 (4.4)	8 (0.5) 243 (1.9)	9 (0.4) 281 (1.7)
1/2 Hour or Less	38 (1.2) 207 (1.4)	23 (0.8) 258 (1.4)	22 (0.6) 288 (0.7)
1 Hour	29 (0.9) 209 (1.7)	36 (0.8) 262 (0.9)	28 (0.7) 285 (1.1)
More Than 1 Hour	16 (0.8) 201 (1.9)	26 (1.1) 267 (1.1)	27 (0.8) 291 (1.3)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

The Use of Newspapers, Magazines, or Journals in Learning Geography. Articles in a range of periodicals can supplement geography learning both inside and outside the classroom.[10] Students who indicated that they do read such materials may be reading them both in and out of school. In either case, for eighth-grade students, there was a positive relationship between reading these materials and geography performance. Table 4.21 shows percentages of students reading periodicals related to geography and their average scale scores.

Approximately two-thirds of students at grades 4 and 8 reported reading such materials at least sometimes. At grade 8, students who reported reading these materials sometimes outperformed students who reported never reading them. However, at grade 4, students who reported reading such periodicals sometimes or never outperformed those who reported reading them more frequently.

TABLE 4.21

Students' Reports on Reading Newspapers, Magazines, or Journals Related to Geography Grades 4 and 8

	Grade 4	Grade 8
	Percentage and Average Scale Score	Percentage and Average Scale Score
Often	20 (0.7) 200 (1.9)	15 (0.6) 260 (1.4)
Sometimes	48 (0.9) 208 (1.4)	52 (0.8) 262 (0.9)
Never	33 (0.8) 208 (1.8)	32 (0.9) 257 (1.1)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Students' Home Support

The support students receive at home for learning is as important in geography as it is for other subjects surveyed in NAEP assessments. Variables related to students' home environment often show a strong relationship to performance. The following section presents information about home support for geography learning.

Discussing Schoolwork at Home. A measure of the importance of schoolwork for students and their families is how often schoolwork is discussed at home. When students discuss academic work at home, they create an important link between home and school. Recent studies have noted the positive relationship between parental involvement in schooling and student achievement.[11] Supporting cooperation between parents and schools is a major objective of many recent educational reform efforts, among them the *National Education Goals*.[12]

Students in the NAEP 1994 geography assessment were asked how frequently they discussed their studies at home. (This question was not restricted to discussing social studies or geography studies at home but referred to all subject areas.) Their responses are summarized in Table 4.22. The majority of students across grades reported discussing their studies at home at least sometimes. Seventy-eight percent of fourth graders, 68 percent of eighth graders, and 62 percent of twelfth graders reported discussing their studies at home at least once or twice a week. However, approximately one-fifth of fourth and eighth graders, and nearly one-quarter of twelfth graders, reported never or hardly ever discussing their studies at home.

At all three grades, students who reported never or hardly ever discussing their studies at home were outperformed by students who reported discussing their studies on a regular basis. At grade 8, students who reported daily discussions outperformed students who reported discussions once or twice a week or month, and students who reported discussions once or twice a week outperformed those reporting discussions once or twice a month. At grade 12, students who reported daily or weekly discussions outperformed those reporting discussions once or twice a month.

TABLE 4.22

Students' Reports on the Frequency with Which They Discuss Their Studies at Home* Grades 4, 8, and 12

	Grade 4	Grade 8	Grade 12
	Percentage and Average Scale Score	Percentage and Average Scale Score	Percentage and Average Scale Score
Almost Every Day	56 (0.8) 209 (1.4)	39 (0.9) 267 (0.9)	31 (0.8) 290 (1.0)
Once or Twice a Week	22 (0.6) 210 (1.6)	29 (0.7) 264 (1.2)	31 (0.7) 288 (0.9)
Once or Twice a Month	5 (0.4) 206 (3.2)	11 (0.5) 257 (2.3)	14 (0.6) 283 (1.3)
Never or Hardly Ever	17 (0.8) 191 (2.2)	21 (0.6) 251 (1.3)	24 (0.7) 277 (1.0)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

*This question was not restricted to discussing social studies or geography studies but referred to all subject areas.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Literacy Materials in the Home. Students can learn much about geography from written sources read outside of school. Newspapers and magazines, for example, can expand students' knowledge of place locations, as well as cultural, environmental, and economic patterns relevant to today's geography curriculum. Moreover, parents who read regularly model a pattern of curiosity and lifelong learning that is important for their childrens' academic success.[13] As part of the NAEP assessments, students at all three grades are asked whether their families have an encyclopedia, receive a newspaper regularly, receive any magazines regularly, or have more than 25 books in the home. Table 4.23 presents the percentages of students reporting that their families have all four types, only three types, or two or fewer types of these literacy materials.

As presented in the table, 38 percent of fourth graders, 51 percent of eighth graders, and 57 percent of twelfth graders reported having all four kinds of literacy materials in the home. Across all three grades, the more types of literacy materials reported in the home, the higher the average geography scale scores.

TABLE 4.23

Students' Reports on the Number of Different Types of Literacy Materials in Their Home
Grades 4, 8, and 12

	Grade 4	Grade 8	Grade 12
	Percentage and Average Scale Score	Percentage and Average Scale Score	Percentage and Average Scale Score
4 Items	38 (1.0) 220 (1.6)	51 (0.7) 270 (0.8)	57 (0.9) 291 (0.8)
3 Items	33 (0.7) 206 (1.4)	28 (0.6) 257 (1.1)	27 (0.7) 282 (0.9)
2 or Fewer Items	29 (0.9) 189 (1.5)	22 (0.6) 240 (1.1)	16 (0.5) 270 (1.2)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Television Viewing Habits. Past NAEP assessments have highlighted the national concern over the amount of time students spend watching television. For example, the NAEP 1992 and 1994 reading assessments found a negative relationship between the amount of television watching and reading performance. A major concern is the possibility that time spent watching television may be consuming time that could be spent on schoolwork or reading activities.

Table 4.24 presents students' reports of their television-viewing habits. Thirty-nine percent of fourth graders, 44 percent of eighth graders, and 46 percent of twelfth graders, reported watching two to three hours of television per day. Twenty percent of fourth graders, 16 percent of eighth graders, and 7 percent of twelfth graders reported watching six hours or more per day.

Generally, there was a negative relationship between increased hours of television viewing and student performance. At all three grades, students who reported watching six or more hours of television per day scored lower, on average, than students who reported less frequent viewing. In addition, at grade 4, students who reported watching two to three hours of television per day outperformed those who watched four to five hours per day. At grades 8 and 12, the less time spent watching television, the higher the average geography score.

TABLE 4.24

Students' Reports on the Amount of Time Spent Watching Television Each Day Grades 4, 8, and 12

	Grade 4	Grade 8	Grade 12
	Percentage and Average Scale Score	Percentage and Average Scale Score	Percentage and Average Scale Score
1 Hour or Less	19 (0.7) 209 (2.0)	13 (0.7) 270 (1.8)	29 (0.8) 292 (1.2)
2 - 3 Hours	39 (0.8) 214 (1.5)	44 (0.8) 266 (0.8)	46 (0.7) 286 (0.8)
4 -5 Hours	22 (0.7) 208 (1.7)	27 (0.9) 257 (1.0)	18 (0.5) 276 (1.0)
More than 6 Hours	20 (0.8) 185 (2.1)	16 (0.6) 240 (1.2)	7 (0.3) 267 (1.8)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Student Interest in Geography

A curiosity about and interest in geography may foster learning of the subject at school or at home. The NAEP 1994 geography assessment asked students to indicate whether geography is their favorite subject, whether they like other subjects better, or whether they have never studied geography. Table 4.25 shows student-reported degrees of interest in geography, and related average scale scores.

As the table indicates, between 14 and 26 percent of students reported that geography was their favorite subject. Students across the three grades who did report that geography was their favorite subject scored significantly higher than students who preferred other subjects.

TABLE 4.25

Students' Reports on How Much They Like Studying Geography Grades 4, 8, and 12

	Grade 4	Grade 8	Grade 12
	Percentage and Average Scale Score	Percentage and Average Scale Score	Percentage and Average Scale Score
Favorite Subject	26 (0.8) 214 (1.6)	19 (0.8) 274 (1.2)	14 (0.6) 297 (1.3)
Like Other Subjects Better	57 (0.8) 208 (1.4)	67 (0.9) 260 (0.7)	63 (1.1) 285 (0.8)
Never Studied	17 (0.7) 191 (1.8)	14 (0.6) 241 (1.9)	23 (1.2) 277 (1.3)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages and average scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Summary

The picture of geography education and student performance gained from an examination of background variables relating both to course work and classroom practices is quite varied. Encouragingly, exposure to geography at grade 8 and to social studies at grades 4 and 12 was associated with higher average scale scores. While grade 12 students who indicated that they were currently taking geography had lower scores, the more semesters of potentially geography-related course work done, the higher the scores. Moreover, grade 12 students who indicated that they had taken a course in world geography outperformed those who reported that they had not.

Although some discrepancies exist between teacher- and student-reported data about instructional materials and practices, it is fair to say that the materials and practices reviewed in this report all received at least moderate use. For example, approximately one-third of fourth and eighth graders reported using maps and globes once or twice a week, while 79 percent of grade 8 students who were currently taking geography reported doing geography-related projects at least sometimes.

Generally, some use of instructional materials, such as films, videos, and filmstrips, was associated with higher scale scores, although computer use was negatively associated with scores. The relationships between amounts of homework (across all subject areas) and geography scale scores for students in grades 4, 8, and 12 were positive. There was also a positive relationship between amount of time spent on geography homework and scale scores for grade 8 students who were currently taking geography.

Performance associated with home support variables was consistent with educational research findings. Discussion of schoolwork at home and literacy materials in the home were both associated with higher scores, while frequent television watching was associated with lower scores. (Given the number of factors the NAEP assessment cannot control for, the reader is again cautioned against drawing causal inferences.)

Finally, students across the three grades who reported that geography was their favorite subject outperformed those who preferred other subjects.

Endnotes

1. *Geography for Life: National Geography Standards 1994.* Geography Education Standards Project. Washington, DC: National Geographic Research and Exploration.

2. Teachers of eighth-grade students participating in the assessment were also asked to complete a questionnaire. The questionnaire contained U.S. history sections (for teachers with students taking the NAEP 1994 U.S. history assessment) and geography sections (for teachers with students taking the NAEP 1994 geography assessment). The U.S. history sections appeared first in the questionnaire. Since many of the eighth-grade teachers taught students in both assessments, a large portion inadvertently completed the U.S. history sections of the questionnaire instead of the geography sections. Therefore, at the eighth grade, students' geography performance could not be adequately matched to teachers' reports of instructional practices.

3. As part of the 1994 NAEP geography assessment, school administrators were asked how many semesters of geography their schools required for student graduation from grade 12.

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6. *Geography for Life: National Geography Standards 1994.* Geography Education Standards Project. Washington, DC: National Geographic Research and Exploration.

7. Ibid.

8. *Geography Framework for the 1994 National Assessment of Educational Progress.* Washington, DC: National Assessment Governing Board.

9. Ibid.

10. *Geography for Life: National Geography Standards 1994.* Geography Education Standards Project. Washington, DC: National Geographic Research and Exploration.

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CHAPTER 5

What Students Know and Can Do in Geography

This chapter provides additional perspective on what students *know and can do* in geography by examining the specific knowledge and skills demonstrated by students at various points on the composite geography scale, and the three subscales (the subscales correspond to the three geography content areas, around which the assessment was organized).

An overview of the geography knowledge and abilities demonstrated by students within three performance ranges on the geography scale, and information on their self-reported study habits, is included. Average scale score results are presented for the nation and for selected subgroups of students based on the three subscales. Finally, selected illustrative questions are displayed in item maps, which indicate the types of questions that were likely to be answered successfully by students scoring at particular levels on the content-area subscales.

Overview of Students' Performance on the NAEP Geography Scale

The NAEP geography scale, ranging from 0 to 500, summarizes the overall score results of students at the fourth, eighth, and twelfth grades. The following descriptions of students' knowledge and abilities are based on sets of questions that were answered successfully by students performing within three ranges on the scale. These ranges represent lower, middle, and higher performance based on percentile distributions. The sets of questions identified in each of the three ranges on the scale were analyzed by geography education experts to characterize the nature of students' geography knowledge and abilities. (Appendix B contains a description of the procedures used to generate this portrait of students.)

Fourth-Grade Profile. Grade 4 students who were near the 25th percentile (scale range 170 to 187) demonstrated success working with maps and diagrams. They could read a simple map key and an elevation profile, and they showed a rudimentary understanding of how to construct a map from written directions. They demonstrated partial knowledge of the location of the equator, the poles, and continents. These students could identify a major ecosystem from visual clues and demonstrated an initial understanding of human actions leading to deforestation.

Fourth-grade students who were near the 50th percentile (scale range 206 to 216) were able to extract basic information from an atlas, maps, photographs, and a bar graph. Given a number of options on a map, students could locate Hawaii. They knew the approximate location of their home state or district and could locate some of the countries in North America. They showed a rudimentary understanding of how to construct a weather map from written directions. Students at this level were able to answer some uncomplicated questions that did not rely on visual prompts, such as questions relating to climate, diffusion of information, and environmental issues such as pollution.

Fourth-grade students who were near the 90th percentile (scale range 249 to 269) demonstrated an ability to use scale, measurement, and direction. They could interpret and apply information from simple thematic maps and graphics. Given outline maps of the United States and Canada, these students could identify bodies of water and a mountain range. They could also identify Canada, the United States, and Mexico and could locate Japan and Australia. Students were able to construct a weather map and a map of a town from written directions. They demonstrated understanding of some physical geographic concepts such as Earth-Sun relationships and soil erosion. They also demonstrated knowledge of the relationship between climate and economic activities and limited knowledge of reasons for migration. These students knew some consequences of how technology affects the environment, and they had a rudimentary understanding of the consequences of human activities, such as waste disposal.

Eighth-Grade Profile. Eighth-grade students who were near the 25th percentile (scale range 230 to 243) could read and extract data from visuals such as diagrams, simple line graphs, and a bar graph and could make uncomplicated inferences from photographs of desert landscapes. They understood a basic coordinate system and could identify their home state or district, South America, and Antarctica. These students could locate information on simple reference maps and, using an atlas, could make simple inferences from information contained in thematic maps.

Eighth-grade students who were near the 50th percentile (scale range 258 to 267) could locate some major rivers and lakes in North America and recognize some simple landform and water features. They could construct maps from written instructions with partial accuracy that improved when a grid system was given. They understood the function of a transit map and had partial success mapping out a specified route. These students demonstrated knowledge of what causes earthquakes and were able to make connections between climates and locations of cities and between climates and types of crops. Students were able to recognize relationships between topography and human settlement and could identify a reason for an urban land use pattern. They demonstrated some understanding of movement in relation to immigration and trade.

Those eighth-grade students who were near the 90th percentile (scale range 295 to 312) demonstrated an ability to use a range of geographic tools such as graphs, pie charts, population pyramids, climographs, cross-sectional diagrams, and an isotherm map. They could identify the largest ocean and knew which country was located in the Alps. They could also find major physical features on different types of maps at a variety of scales. Students could infer geographic processes from visual representations, and they could construct maps from written instructions using a scale and legend accurately when given a grid and with considerable accuracy without a grid. These students understood the influence of elevation on climate and of climate on vegetation and had some understanding of the effect of monsoon winds on climate and economy. Students at this level demonstrated some understanding of the dynamic interconnections between human systems and physical systems and understood what contributes to air pollution. They could apply uncomplicated concepts of economic development, trade and transportation, and economic interdependence and could relate geographic concepts to historical knowledge.

Twelfth-Grade Profile. Students who were near the 25th percentile (scale range 259 to 270) could read and interpret visual material in the form of single maps, (as opposed to sets of maps or maps with accompanying text). They demonstrated knowledge of basic physical geography terms, could interpret a map to locate a region, and showed some understanding of processes relating to earthquakes and erosion. Students could identify where Spanish is spoken on a world map. These students demonstrated a rudimentary understanding of relationships between topography and human settlement and of how relationships between and among places are affected by factors such as accessibility, proximity, and distance.

Twelfth-grade students who were near the 50th percentile (scale range 283 to 291) were able to locate some physical features such as United States deserts and identify major world religious centers. They demonstrated knowledge of some fundamental geographic skills such as the ability to read and interpret contour maps, different map projections, and a time zone map. Students were able to use atlases to answer fundamental physical geography questions relating to climate, natural vegetation, and growing seasons. They demonstrated understanding of how major processes such as weathering and erosion shape patterns in the natural environment and of the influence of natural systems on human environments. Students displayed some ability to translate narrative descriptions that include data into maps. These students demonstrated knowledge of physical reasons for land use patterns, understanding of movements such as diffusion and migration, and some understanding of reasons for trade.

Twelfth-grade students who were near the 90th percentile (scale range 316 to 329) were able to compare different kinds of maps, graphics, diagrams, tables, and other visuals to draw conclusions and interpret information. They were often able to apply some outside knowledge to interpret maps and other visuals. These students were able to transfer information from one reporting form to another and could draw generally accurate two-dimensional maps. They could locate and label features such as the Mississippi River and the Rockies on a cross-sectional diagram of the United States, and could identify South America from its elevation profile. Students could identify major deserts on a world map. They were able to infer some physical geomorphic processes from examining physical features shown on a map. They also understood regional terms such as "megalopolis" and "corn belt", and concepts relating to connections among places such as travel and transportation.

Students at this level could recognize the economic and political importance of places such as the Suez Canal and demonstrated some understanding of how political unrest can influence economies. They knew a reason for the formation of the Organization of Petroleum Exporting Countries and could identify the countries that belong to this organization. Using a map showing the languages of Africa, students could interpret information about language patterns in Africa. These students also demonstrated partial understanding of causes and consequences of human migration and a rudimentary ability to discuss different people's perspectives of the same environment at a variety of scales, local to global.

Profiles of Students' Geography Knowledge, Abilities, and Study Habits

Figures 5.1, 5.2, and 5.3 show profiles of the lower-, middle-, and higher-performing students. The profiles link the knowledge and abilities of these students with their self-reported study habits, and also summarize the performance descriptions from the previous section. The study habits presented in the figures are based on students' self-reports about three activities: number of pages read per day in school, hours per day spent on homework, and frequency of discussing studies at home.

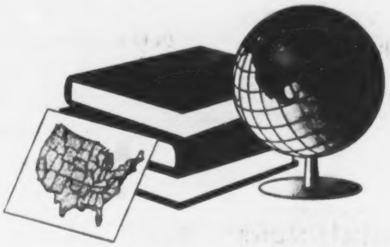
By examining all three profiles, a common pattern emerged at each grade. As the students' geography scores increased, the complexity and sophistication of the geographic knowledge and skills they exhibited increased. Moreover, students performing at the higher range of the scale were more likely to read more pages per day, spend more time on homework, and more frequently discuss their studies at home.[1]

Figure 5.1 Profiles of Lower, Middle, and Higher Performing Fourth Graders: **Geography Knowledge, Abilities, and Study Habits**

25th Percentile

Fourth-grade students who were near the 25th percentile could:

- read simple maps and diagrams
- show initial understanding of the relationship between human and natural systems
- identify a major ecosystem from visual clues



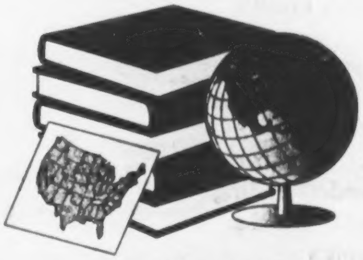
Study habits of fourth graders who were near the 25th percentile:

- 48 percent read more than 10 pages each day in school and for homework
- 44 percent spent one or more hours each day on homework
- 73 percent discussed studies at home at least once or twice a week

50th Percentile

Fourth-grade students who were near the 50th percentile could:

- extract basic information from an atlas, photographs, and other visuals
- label approximate location of home state or district on a map
- grasp simple concepts, such as relationships between geography and the diffusion of information



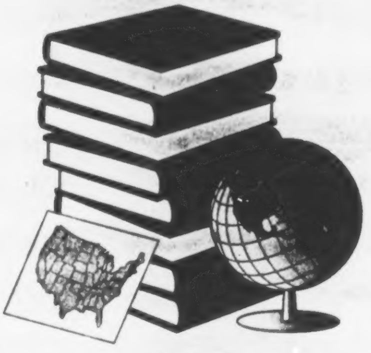
Study habits of fourth graders who were near the 50th percentile:

- 50 percent read more than 10 pages each day in school and for homework
- 46 percent spent one or more hours each day on homework
- 77 percent discussed studies at home at least once or twice a week

90th Percentile

Fourth-grade students who were near the 90th percentile could:

- use scale, measurement, and direction
- interpret and apply information from simple thematic maps and graphics
- grasp some physical geographic concepts, such as Earth/Sun relationships



Study habits of fourth graders who were near the 90th percentile:

- 62 percent read more than 10 pages each day in school and for homework
- 47 percent spent one or more hours each day on homework
- 85 percent discussed studies at home at least once or twice a week

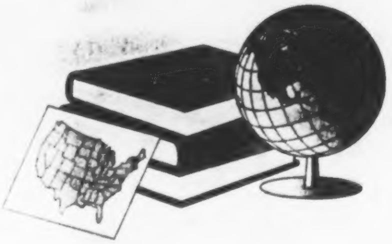
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Figure 5.2 Profiles of Lower, Middle, and Higher Performing Eighth Graders: Geography Knowledge, Abilities, and Study Habi

25th Percentile

Eighth-grade students who were near the 25th percentile could:

- read and extract data from visuals, such as diagrams and simple line graphs
- make simple inferences from photographs of a natural region
- read and interpret thematic maps in an atlas



Study habits of eighth graders who were near the 25th percentile:

- 31 percent read more than 10 pages each day in school and for homework
- 58 percent spent one or more hours each day on homework
- 60 percent discussed studies at home at least once or twice a week

50th Percentile

Eighth-grade students who were near the 50th percentile could:

- recognize a range of simple physical features and patterns of the environment
- cite probable cause of a natural event
- grasp some interactions between natural and human systems, such as relationships between topography and human settlement

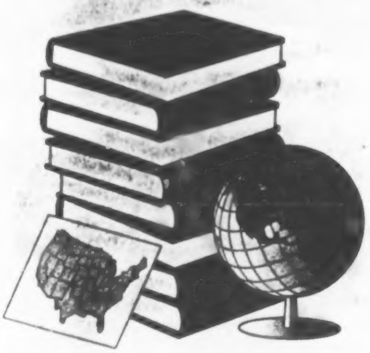
Study habits of eighth graders who were near the 50th percentile:

- 35 percent read more than 10 pages each day in school and for homework
- 64 percent spent one or more hours each day on homework
- 68 percent discussed studies at home at least once or twice a week

90th Percentile

Eighth-grade students who were near the 90th percentile could:

- use a range of tools, such as pie charts, population pyramids, and climographs
- construct maps from written instructions using scale and legend accurately
- apply simple concepts of economic development and interdependence



Study habits of eighth graders who were near the 90th percentile:

- 48 percent read more than 10 pages each day in school and for homework
- 70 percent spent one or more hours each day on homework
- 77 percent discussed studies at home at least once or twice a week

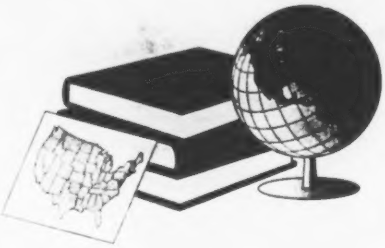
SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Figure 5.3 Profiles of Lower, Middle, and Higher Performing Twelfth Graders: Geography Knowledge, Abilities, and Study Habits

25th Percentile

Twelfth-grade students who were near the 25th percentile could:

- read and interpret visual material from a map
- recognize basic physical geography terms
- grasp some influences of proximity and distance on relationships between and among places



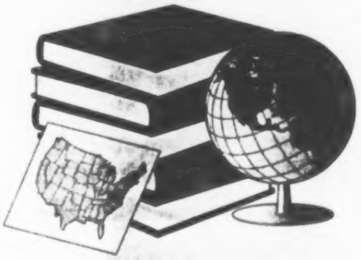
Study habits of twelfth graders who were near the 25th percentile:

- 29 percent read more than 10 pages each day in school and for homework
- 52 percent spent one or more hours each day on homework
- 55 percent discussed studies at home at least once or twice a week

50th Percentile

Twelfth-grade students who were near the 50th percentile could:

- read and interpret contour maps, different map projections, and a time zone map
- use atlases to answer fundamental physical geography questions, such as those relating to climate and vegetation
- show understanding of how major processes, such as weathering and erosion, shape patterns in the natural environment
- show knowledge of major processes of human geography, such as migration and diffusion



Study habits of twelfth graders who were near the 50th percentile:

- 40 percent read more than 10 pages each day in school and for homework
- 53 percent spent one or more hours each day on homework
- 59 percent discussed studies at home at least once or twice a week

90th Percentile

Twelfth-grade students who were near the 90th percentile could:

- compare different kinds of maps, graphics, and other visuals to draw conclusions and interpret information
- locate and label a range of features of the physical and human environments on maps and diagrams
- infer some physical geomorphic processes from physical features shown on a map
- discuss in rudimentary terms different people's perspectives of the same environment at a variety of scales, local to global

Study habits of twelfth graders who were near the 90th percentile:

- 57 percent read more than 10 pages each day in school and for homework
- 62 percent spent one or more hours each day on homework
- 74 percent discussed studies at home at least once or twice a week

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Average Performance by Content Areas

As described in Chapter 1, the NAEP 1994 geography assessment was organized around the following three content areas:

- ***Space and Place.*** Knowledge of geography related to particular places on Earth, to spatial patterns on Earth's surface, and to physical and human processes that shape such patterns.
- ***Environment and Society.*** Knowledge of geography related to the interactions between the environment and society.
- ***Spatial Dynamics and Connections.*** Knowledge of geography related to spatial variations and connections among people and places.

The three content areas were designed to ensure coverage of the major branches of geography. They were seen as broad areas that would sometimes overlap to accomplish this coverage. (The geographic cognitive areas presented in the NAEP geography framework cut across all three content areas.) A look at the patterns of student performance on the subscales can contribute to a more precise understanding of composite scale scores, although the patterns of performance among subgroups on the composite scale were also generally evident for the subscales.

Performance on Geography Content Areas for the Nation. Table 5.1 presents the 1994 average scores by geography content areas for students at grades 4, 8, and 12. The subscales for the three areas were created independently of one another and no attempt was made to equate the subscales. Therefore, comparisons across subscales (for example, fourth graders performed better on Content Area 1 than Content Area 2) are not necessarily meaningful. Appendix A contains a more extensive discussion of the geography scaling procedures.

Patterns of performance among subgroups on the composite scale were also generally evident for the content area subscales.

TABLE 5.1

Average Scale Scores at Various Percentiles by Geography Content Areas
Grades 4, 8, and 12

	Composite	Content Area 1 *Space and Place*	Content Area 2 *Environment and Society*	Content Area 3 *Spatial Dynamics and Connections*
Grade 4				
Average Subscale Score	206 (1.2)	208 (1.3)	204 (1.3)	204 (1.2)
10th Percentile	146 (1.9)	148 (1.8)	138 (2.8)	147 (1.6)
25th Percentile	179 (1.4)	181 (1.4)	175 (1.3)	178 (2.[illegible])
50th Percentile	211 (1.3)	213 (1.8)	210 (1.5)	209 (1.[illegible])
75th Percentile	237 (1.2)	240 (1.8)	239 (1.8)	234 (1.3)
90th Percentile	257 (1.8)	261 (1.4)	261 (2.1)	254 (1.8)
Grade 8				
Average Subscale Score	260 (0.7)	259 (0.8)	263 (0.7)	257 (0.9)
10th Percentile	213 (1.3)	209 (1.1)	218 (1.4)	211 (1.1)
25th Percentile	237 (0.9)	234 (0.9)	242 (0.9)	235 (1.2)
50th Percentile	263 (1.0)	262 (0.9)	266 (0.8)	261 (1.3)
75th Percentile	285 (0.9)	285 (1.1)	287 (0.7)	282 (1.0)
90th Percentile	303 (1.6)	305 (0.8)	304 (1.0)	300 (1.3)
Grade 12				
Average Subscale Score	285 (0.7)	283 (0.8)	283 (0.7)	288 (0.8)
10th Percentile	244 (0.9)	237 (1.1)	247 (0.9)	248 (1.1)
25th Percentile	265 (0.9)	260 (1.0)	265 (1.3)	268 (0.9)
50th Percentile	287 (0.8)	286 (0.8)	285 (0.8)	291 (1.0)
75th Percentile	307 (0.9)	308 (0.8)	302 (1.0)	310 (0.9)
90th Percentile	321 (0.9)	326 (0.9)	315 (0.9)	325 (1.0)

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Performance on Geography Content Areas by Region. Table 5.2 presents the average scale scores and subscale results by region. These results are fairly consistent with the composite scale results found at each grade.

- At grade 4, for the composite scale and all three subscales, students from the Central region outperformed students from the Southeast. Students from the Central region also outperformed students from the Northeast for *Space and Place*, and students from the West for *Spatial Dynamics and Connections*.
- At grade 8, students from the Northeast and Central regions outperformed students from the Southeast and the West for all three content areas.
- At grade 12, students from the Northeast outperformed students from the Southeast for *Space and Place* and *Spatial Dynamics and Connections*. Central region students outperformed students from the Northeast for *Space and Place* and students from the Southeast for all three content areas. Finally, students from the West outperformed those from the Southeast for all content areas.

TABLE 5.2

Average Scale Scores in Geography Content Areas by Region
Grades 4, 8, and 12

	Composite	Content Area 1 *Space and Place*	Content Area 2 *Environment and Society*	Content Area 3 *Spatial Dynamics and Connections*
Grade 4				
Total	206 (1.2)	208 (1.3)	204 (1.3)	204 (1.2)
Region				
Northeast	203 (2.7)	204 (2.8)	201 (2.9)	203 (2.7)
Southeast	200 (2.5)	201 (2.5)	199 (3.0)	199 (2.5)
Central	215 (3.2)	217 (3.3)	214 (3.9)	213 (2.9)
West	205 (1.7)	209 (2.1)	202 (2.0)	202 (1.9)
Grade 8				
Total	260 (0.7)	259 (0.8)	263 (0.7)	257 (0.9)
Region				
Northeast	266 (1.9)	265 (2.2)	268 (1.7)	264 (2.1)
Southeast	252 (1.6)	249 (1.8)	257 (1.5)	251 (1.8)
Central	268 (1.6)	269 (1.7)	270 (1.7)	266 (1.7)
West	255 (1.8)	254 (2.0)	260 (1.7)	253 (1.8)
Grade 12				
Total	285 (0.7)	283 (0.8)	283 (0.7)	288 (0.8)
Region				
Northeast	284 (1.6)	282 (1.7)	282 (1.4)	288 (1.8)
Southeast	278 (1.1)	276 (1.3)	278 (0.9)	281 (1.1)
Central	289 (1.8)	289 (2.0)	285 (1.7)	292 (1.8)
West	286 (1.9)	285 (2.1)	285 (1.7)	290 (1.9)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progre . (NAEP), 1994 Geography Assessment.

Performance on Geography Content Areas by Race/ Ethnicity. Table 5.3 reports the subscale results and the overall average scale scores for racial/ethnic subgroups. With some exceptions, White and Asian students outperformed Black and Hispanic students, and Hispanic students outperformed Black students, as on the composite scale. (Racial/ethnic classifications are based on self-reported information provided by students.)

For the Pacific Islander and American Indian student samples at grades 8 and 12, the nature of the samples does not allow accurate determination of the standard errors. For this reason, differences among these samples and other racial/ethnic subgroups are not discussed for those two grades.

- At grade 4, for each content area, White students had a significantly higher average score than Black, Hispanic, and American Indian students, and American Indian students had a significantly higher average score than Black students. Hispanic students outperformed Black students for *Space and Place* and *Environment and Society,* but not for *Spatial Dynamics and Connections* (an exception to the pattern for the composite scale). Asian students

TABLE 5.3

Average Scale Scores in Geography Content Areas by Race/Ethnicity
Grades 4, 8, and 12

	Composite	Content Area 1 *Space and Place*	Content Area 2 *Environment and Society*	Content Area 3 *Spatial Dynamics and Connections*
Grade 4				
Total	206 (1.2)	208 (1.3)	204 (1.3)	204 (1.2)
Race/Ethnicity				
White	218 (1.5)	220 (1.7)	218 (1.7)	215 (1.5)
Black	168 (2.5)	169 (2.8)	162 (2.9)	171 (2.2)
Hispanic	183 (2.5)	187 (2.6)	180 (2.9)	181 (2.8)
Asian	218 (5.0)	224 (5.2)	210 (6.6)	219 (4.8)
Pacific Islander	205 (5.3)	207 (5.9)	203 (8.0)	204 (6.0)
American Indian	193 (3.6)	196 (3.5)	191 (4.3)	190 (3.5)
Grade 8				
Total	260 (0.7)	259 (0.8)	263 (0.7)	257 (0.9)
Race/Ethnicity				
White	270 (0.8)	270 (0.9)	273 (0.8)	267 (1.1)
Black	229 (1.7)	225 (1.8)	235 (1.8)	230 (1.7)
Hispanic	239 (1.9)	237 (2.2)	244 (1.7)	236 (2.0)
Asian	271 (2.7)	273 (2.8)	274 (2.5)	266 (3.6)
Pacific Islander	252 (8.5) !	249 (8.5) !	256 (9.2) !	252 (8.3) !
American Indian	248 (3.4) !	246 (4.0) !	253 (3.3) !	246 (3.3) !
Grade 12				
Total	285 (0.7)	283 (0.8)	283 (0.7)	288 (0.8)
Race/Ethnicity				
White	291 (0.8)	291 (0.9)	288 (0.7)	294 (0.8)
Black	258 (1.4)	252 (1.7)	261 (1.2)	264 (1.5)
Hispanic	268 (1.5)	264 (1.8)	267 (1.5)	273 (1.6)
Asian	287 (3.2)	285 (3.5)	283 (3.0)	293 (3.6)
Pacific Islander	282 (3.1) !	281 (3.3) !	279 (3.2) !	285 (3.7) !
American Indian	***	***	***	***

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

! Interpret with caution any comparisons involving this statistic. The nature of the sample does not allow for accurate determination of the variability of this value.

*** Sample size insufficient to permit a reliable estimate (see Appendix A).

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

outperformed Black and Hispanic students on all subscales and American Indian students for *Space and Place* and *Spatial Dynamics and Connections.* Pacific Islander students outperformed Black and Hispanic students for *Space and Place* and *Spatial Dynamics and Connections* and Black students for *Environment and Society.*

- At grade 8, for each content area, White and Asian students had significantly higher average scores than Black and Hispanic students. Hispanic students outperformed Black students for *Space and Place* and *Environment and Society,* but not for *Spatial Dynamics and Connections* (again, an exception to Hispanic students' performance on the composite scale).
- At grade 12, for each content area, Hispanic students demonstrated a higher average score than Black students, and Asian students demonstrated a higher average score than Black and Hispanic students. White students had significantly higher average scores than Black and Hispanic students in all content areas.

Performance on Geography Content Areas by Gender. Table 5.4 presents male and female students' performance on the three geography content areas. As reported in Chapter 2, males did demonstrate average scale scores significantly higher than those for females at all three grade levels on the composite scale. There were some deviations from this pattern when performance was examined at the subscale level.

- At grade 4, male students outperformed female students for the content area *Space and Place,* but there were no significant differences for the other two content areas.
- At grade 8, male students outperformed female students for *Space and Place* and *Environment and Society,* but not for *Spatial Dynamics and Connections.*
- At grade 12, as on the composite scale, male students outperformed female students in all three geography content areas.

TABLE 5.4

Average Scale Scores in Geography Content Areas by Gender
Grades 4, 8, and 12

	Composite	Content Area 1 *Space and Place*	Content Area 2 *Environment and Society*	Content Area 3 *Spatial Dynamics and Connections*
Grade 4				
Total	206 (1.2)	208 (1.3)	204 (1.3)	204 (1.2)
Gender				
Male	208 (1.4)	212 (1.6)	206 (1.4)	206 (1.5)
Female	203 (1.4)	204 (1.5)	203 (1.7)	202 (1.4)
Grade 8				
Total	260 (0.7)	259 (0.8)	263 (0.7)	257 (0.9)
Gender				
Male	262 (0.9)	262 (1.0)	265 (0.9)	258 (1.1)
Female	258 (0.8)	255 (0.9)	262 (0.7)	257 (1.0)
Grade 12				
Total	285 (0.7)	283 (0.8)	283 (0.7)	288 (0.8)
Gender				
Male	288 (0.8)	288 (1.0)	285 (0.8)	290 (0.9)
Female	281 (0.9)	278 (1.0)	280 (0.8)	286 (1.1)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Performance on Geography Content Areas by Parents' Highest Level of Education. Table 5.5 presents performance by student-reported parental education level for the three content area subscales. The positive relationship between parental level of education and performance noted with the composite scale was also evident for each of the three subscales. Generally, as the level of parental education increased, average subscale scores increased.

- At grade 4, average subscale scores, for the most part, increased with increasing levels of reported parental education. However, across subscales, there were no significant score differences between students who reported that at least one parent had graduated from college and those who reported that at least one parent had some education after high school (consistent with the exception for the composite scale), and between students who reported that at least one parent had graduated from high school and those who reported that neither parent finished high school.
- At grade 8, for all three subscales, average subscale scores increased with increasing levels of parental education.
- Similarly, at grade 12, for all three subscales, average scores increased with increasing levels of parental education.

TABLE 5.5

Average Scale Scores in Geography Content Areas by Parents' Highest Level of Education Grades 4, 8, and 12

	Composite	Content Area 1 Space and Place	Content Area 2 Environment and Society	Content Area 3 Spatial Dynamics and Connections
Grade 4				
Total	206 (1.2)	208 (1.3)	204 (1.3)	204 (1.2)
Parents' Education Level				
Graduated College	216 (1.6)	218 (1.8)	215 (1.8)	215 (1.5)
Some Education After High School	216 (2.5)	218 (2.6)	214 (3.5)	215 (2.8)
Graduated High School	197 (2.5)	199 (2.7)	197 (3.3)	195 (2.2)
Did Not Finish High School	186 (3.7)	189 (4.0)	184 (5.6)	184 (4.0)
I Don't Know	197 (1.4)	200 (1.6)	194 (1.6)	195 (1.5)
Grade 8				
Total	260 (0.7)	259 (0.8)	263 (0.7)	257 (0.9)
Parents' Education Level				
Graduated College	272 (1.0)	272 (1.2)	275 (0.9)	270 (1.2)
Some Education After High School	265 (1.0)	264 (1.3)	269 (0.9)	262 (1.4)
Graduated High School	250 (1.2)	248 (1.5)	254 (1.3)	248 (1.3)
Did Not Finish High School	238 (1.7)	236 (2.0)	242 (1.8)	238 (2.2)
I Don't Know	234 (1.5)	233 (1.8)	240 (1.5)	231 (1.7)
Grade 12				
Total	285 (0.7)	283 (0.8)	283 (0.7)	288 (0.8)
Parents' Education Level				
Graduated College	294 (0.9)	294 (1.0)	291 (0.8)	298 (0.9)
Some Education After High School	286 (1.0)	285 (1.2)	284 (1.0)	289 (1.0)
Graduated High School	274 (1.1)	271 (1.5)	273 (1.0)	278 (1.2)
Did Not Finish High School	263 (1.2)	259 (1.6)	264 (1.3)	267 (1.3)
I Don't Know	257 (2.8)	252 (3.2)	261 (2.6)	261 (3.4)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Performance on Geography Content Areas by Type of Location. Table 5.6 presents the performance of students attending schools in the three types of locations, according to the geography content areas. With one exception, performances on the three content area subscales mirrored performance on the composite scale.

- At grade 4, for all three subscales, students attending schools in urban fringe/large town and rural/small town locations outperformed students attending schools in central city locations.
- At grade 8, for *Space and Place*, students attending schools in urban fringe/large town locations outperformed students attending schools in central city locations. (On the composite scale, students attending schools in urban fringe/large town and rural/small town locations outperformed students attending schools in central city locations.) For the other two subscales, student performance mirrored that of the composite scale.
- At grade 12, for all three subscales, students attending urban fringe/large town schools outperformed students attending both central city and rural/small town schools.

TABLE 5.6

Average Scale Scores in Geography Content Areas by Type of Location
Grades 4, 8, and 12

	Composite	Content Area 1 *Space and Place*	Content Area 2 *Environment and Society*	Content Area 3 *Spatial Dynamics and Connections*
Grade 4				
Total	206 (1.2)	208 (1.3)	204 (1.3)	204 (1.2)
Type of Location				
Central City	196 (2.2)	198 (2.3)	194 (2.5)	195 (2.0)
Urban Fringe/Large Town	213 (1.9)	216 (2.1)	211 (2.2)	211 (1.9)
Rural/Small Town	207 (2.4)	209 (2.7)	207 (2.8)	205 (2.6)
Grade 8				
Total	260 (0.7)	259 (0.8)	263 (0.7)	257 (0.9)
Type of Location				
Central City	255 (1.6)	253 (1.7)	258 (1.5)	253 (1.7)
Urban Fringe/Large Town	264 (1.3)	263 (1.6)	267 (1.2)	261 (1.4)
Rural/Small Town	261 (1.9)	260 (2.2)	265 (1.8)	259 (2.0)
Grade 12				
Total	285 (0.7)	283 (0.8)	283 (0.7)	288 (0.8)
Type of Location				
Central City	282 (1.4)	281 (1.5)	281 (1.2)	286 (1.4)
Urban Fringe/Large Town	288 (1.4)	287 (1.5)	285 (1.2)	292 (1.4)
Rural/Small Town	282 (1.1)	281 (1.3)	280 (1.1)	286 (1.2)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Performance on Geography Content Areas by Type of School. Table 5.7 presents the performance of students attending public and nonpublic schools in the three geography content areas. Again, performances on the three content area subscales mirrored performance on the composite scale. At grades 4, 8, and 12, students attending nonpublic schools had significantly higher average scores than those attending public schools across all three geography content areas.

TABLE 5.7

THE NATION'S REPORT CARD 1994 Geography Assessment

Average Scale Scores in Geography Content Areas by Type of School
Grades 4, 8, and 12

	Composite	Content Area 1 *Space and Place*	Content Area 2 *Environment and Society*	Content Area 3 *Spatial Dynamics and Connections*
Grade 4				
Total	206 (1.2)	208 (1.3)	204 (1.3)	204 (1.2)
Type of School				
Public Schools	204 (1.4)	206 (1.5)	202 (1.5)	203 (1.3)
Nonpublic Schools	221 (2.2)	222 (2.5)	223 (2.5)	218 (2.3)
Catholic Schools	222 (2.6)	223 (2.7)	223 (3.2)	220 (2.8)
Other Nonpublic Schools	220 (3.8)	221 (4.3)	222 (4.1)	215 (3.7)
Grade 8				
Total	260 (0.7)	259 (0.8)	263 (0.7)	257 (0.9)
Type of School				
Public Schools	258 (0.8)	257 (0.9)	262 (0.8)	255 (1.0)
Nonpublic Schools	276 (1.3)	275 (1.4)	278 (1.4)	275 (1.4)
Catholic Schools	276 (1.6)	275 (1.7)	279 (1.9)	276 (1.5)
Other Nonpublic Schools	276 (2.6)	276 (2.9)	277 (2.6)	274 (2.9)
Grade 12				
Total	285 (0.7)	283 (0.8)	283 (0.7)	288 (0.8)
Type of School				
Public Schools	283 (0.8)	282 (0.9)	282 (0.8)	287 (0.8)
Nonpublic Schools	294 (1.6)	293 (1.9)	291 (1.6)	298 (1.7)
Catholic Schools	291 (3.0)	289 (3.3)	289 (2.7)	296 (2.9)
Other Nonpublic Schools	298 (2.0)	299 (2.3)	294 (1.8)	300 (2.6)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated scale scores appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Profiling Students' Performance on the Three Geography Content Areas

To illustrate the range of assessment tasks that students were asked to perform, this section provides a visual representation of each geography content area subscale, called an "item map." The item map shows a set of tasks in the order of their difficulty for the population assessed. Each task is identified by a brief description. Not all the tasks in the assessment could be presented in these figures. Instead, sample tasks were selected to illustrate the range of abilities across the subscales and to demonstrate the types of tasks that students with different subscale scores could typically perform correctly.

The item maps (Figures 5.4, 5.5, and 5.6) identify the points, on each content area subscale at which individual tasks were answered correctly by approximately two-thirds (65 percent) of the students. (The criterion was set at 74 percent for multiple-choice questions to adjust for the possibility of students' answering correctly by guessing.) The point on the subscale item map at which a task is positioned represents the subscale score attained by students who had a 65-percent probability of successfully performing the task. Thus, for each task and its corresponding subscale score, it can be said that at least 65 percent of students at or above that point on the subscale have adequately performed that task.

For example, the fourth-grade *Space and Place* item map (Figure 5.4), indicates that at least 65 percent of fourth graders with a score of 216 or better on the *Space and Place* geography content subscale were able to locate physical features on a map of North America. Fourth graders who scored higher than 216 on this subscale were even more likely to demonstrate this ability, while students who scored lower on the subscale were less likely to do so. In interpreting item map information, it should be kept in mind that students at different grades demonstrated these geography abilities with grade-appropriate materials.

Figure 5.4 Map of Selected Items on the Geography Content Area Subscales for Grade 4

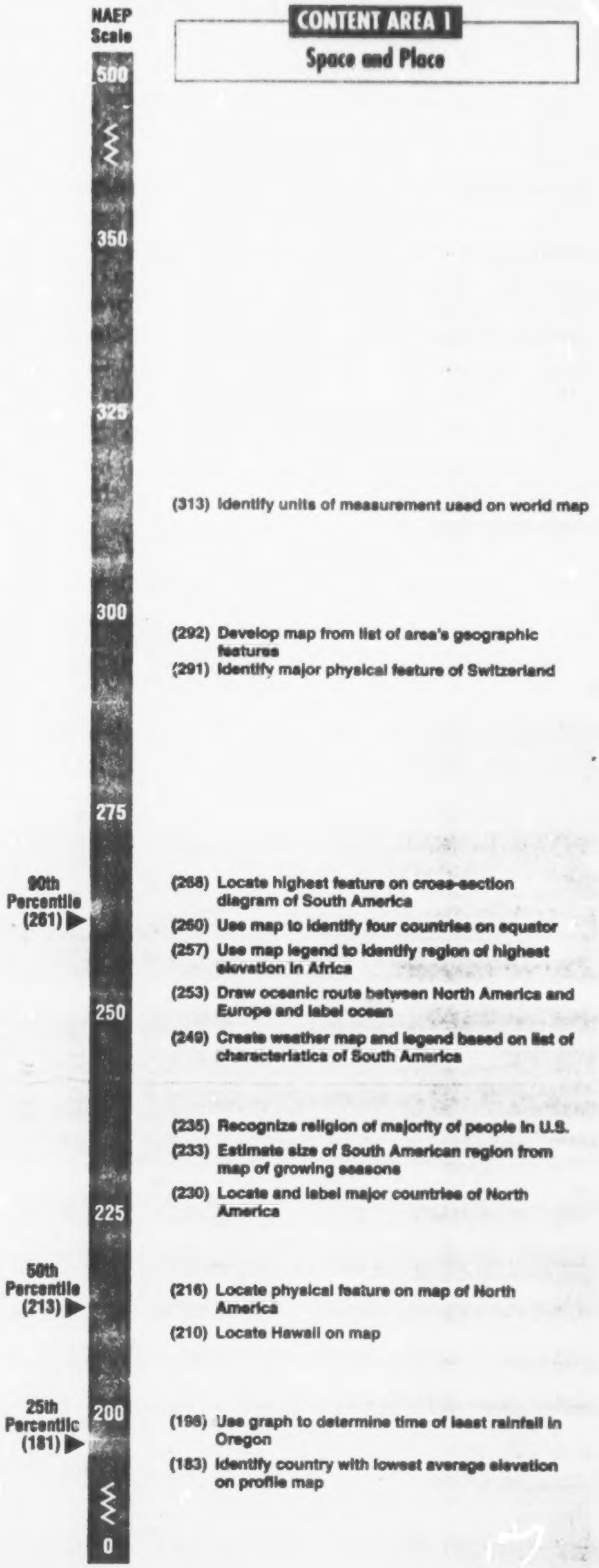
Each geography question was mapped onto the NAEP geography content area subscale on the basis of students' performance. The point on the subscale at which a question is positioned on the map represents the subscale score attained by students who had a 65-percent probability of successfully answering the question.

Thus, it can be said for each question and its corresponding subscale score that students with scores above that point on the subscale have a greater than 65-percent chance of successfully answering the question, while those below that point on the subscale have a less than 65-percent chance. (The probability was set at 74 percent for multiple-choice questions.)

The item map presented in this figure contains selected questions to illustrate the assessment. In interpreting the item map information, it should be kept in mind that students at different grades demonstrated these abilities with grade-appropriate materials.

CONTENT AREA 1

Space and Place



(313) Identify units of measurement used on world map

(292) Develop map from list of area's geographic features

(291) Identify major physical feature of Switzerland

(268) Locate highest feature on cross-section diagram of South America

(260) Use map to identify four countries on equator

(257) Use map legend to identify region of highest elevation in Africa

(253) Draw oceanic route between North America and Europe and label ocean

(249) Create weather map and legend based on list of characteristics of South America

(235) Recognize religion of majority of people in U.S.

(233) Estimate size of South American region from map of growing seasons

(230) Locate and label major countries of North America

(216) Locate physical feature on map of North America

(210) Locate Hawaii on map

(198) Use graph to determine time of least rainfall in Oregon

(183) Identify country with lowest average elevation on profile map

NOTE: In this graphic illustration, the locations of scale points are necessarily approximate for questions clustered closely together.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

NAEP Scale

CONTENT AREA 2

Environment and Society

500
275
250
225
200
0

(318) Describe two effects of oil spills on environment

(299) Explain and compare White and Native American views of land use

(282) Explain impact on physical environment of cutting down forest

(279) Analyze consequences of waste disposal on environment

90th Percentile (261) ▶

(260) Understand impact on environment of enlarging airport

(257) Interpret diagram of seasons to identify reason for summer

(231) Understand soil erosion controls

(226) Recognize technology used to predict weather

(225) Interpret map to infer impact of blocked bridge on transportation route

50th Percentile (210) ▶

(215) Infer location from description of conventional clothing

25th Percentile (175) ▶

(203) Identify environment modified for human use from photographs

(190) Understand sources of air and water pollution

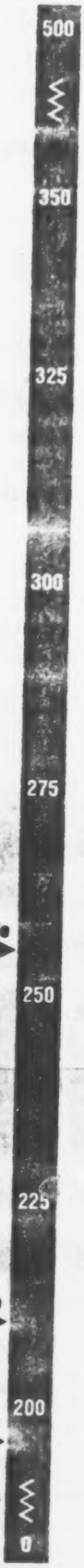
(185) Identify water cycle from picture

(152) Recognize characteristics of rain forest environment

NAEP Scale

CONTENT AREA 3

Spatial Dynamics and Connections



(312) Use map data to identify and explain settleme patterns in China

(309) Interpret physical resource map to identify lik location of large city

(291) Interpret physical resource map to explain whi country produces steel

(289) Interpret bar graph to compare and discuss U.S energy production and consumption

(285) Use several maps to explain highway locations in Canada

(272) Interpret physical resource map to identify countries most in conflict over resources

90th Percentile (254) ▶

(257) Infer trade patterns from export charts

(251) Draw road route on map, create road symbol, and explain chosen location

(250) Identify and draw on transit map the most direc route between two locations

(237) Use map to identify continent with most industr

(234) Understand climate's relationship to trade patte in the United States

(233) Place locations in size order from largest to sm

(228) Understand kinds of information represented on four different maps

50th Percentile (209) ▶

(207) Recognize cause of global diffusion of information

25th Percentile (178) ▶

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Figure 5.5 Map of Selected Items on the Geography Content Area Subscales for Grade 8

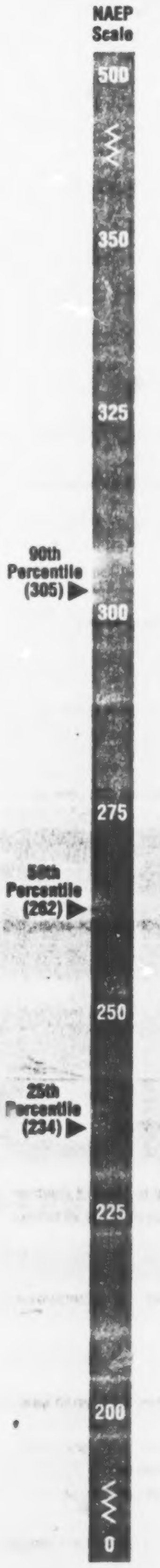
Each geography question was mapped onto the NAEP geography content area subscale on the basis of students' performance. The point on the subscale at which a question is positioned on the map represents the subscale score attained by students who had a 65-percent probability of successfully answering the question.

Thus, it can be said for each question and its corresponding subscale score that students with scores above that point on the subscale have a greater than 65-percent chance of successfully answering the question, while those below that point on the subscale have a less than 65-percent chance. (The probability was set at 74 percent for multiple-choice questions.)

The item map presented in this figure contains selected questions to illustrate the assessment. In interpreting the item map information, it should be kept in mind that students at different grades demonstrated these abilities with grade-appropriate materials.

CONTENT AREA 1

Space and Place



(356) Understand vocabulary and process of water cycle

(334) Draw map of region including isthmus based on description of area

(331) Interpret physical features formed by glaciation

(317) Interpret climate graphs to identify climatic characteristics of given location

(309) Locate two areas on world map with particular climatic characteristics

(294) Infer reason for alteration of landscape shown in photograph

(289) Convert precipitation data from table into pie chart

(277) Infer vegetation characteristic of given area of Brazil from climate map

(269) Recognize world's largest ocean

(263) Understand U.S. trade balance represented on map

(259) Infer location of earthquake epicenter from map

(252) Identify landform that constitutes Florida

(237) Identify scale used to measure earthquake intensity

([illegible]) Locate home state on map

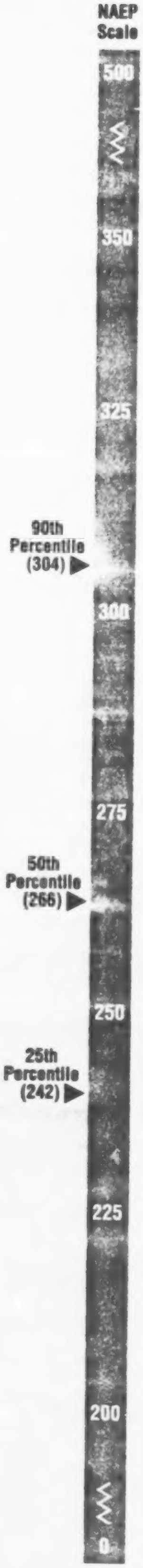
(20[illegible]) Understand where to locate information in atlas

NOTE: In this graphic illustration, the locations of scale points are necessarily *approximate* for questions clustered closely together.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

CONTENT AREA 2

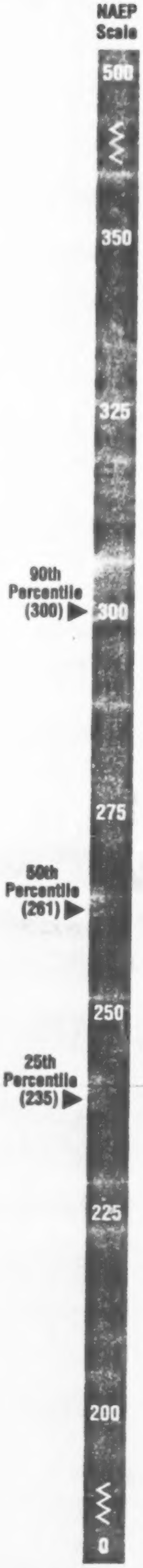
Environment and Society



(430) Infer and describe desert climate from photographic clues
(395) Recognize features in photograph of village that indicate a hot, dry climate
(341) Explain pros and cons of developing nuclear energy
(331) Use map to identify and explain settlement patterns in Egypt
(329) Explain why tundra is difficult to settle
(321) Interpret table and understand human contribution to climatic changes
(311) Recognize what natural processes form fossil fuels
(300) Use map to explain why early civilizations flourished in Tigris/Euphrates valley
(294) Understand effects of ocean currents on Peruvian ecosystem
(291) Interpret diagram to explain stage in water cycle
(283) Understand relationship between natural features shown on map and population size
(275) Interpret data displayed on maps to determine rainfall pattern in South America
(257) Recognize relationship between topography and location of built environments
(217) Recognize what method would enable crop production in desert environment

CONTENT AREA 3

Spatial Dynamics and Connections



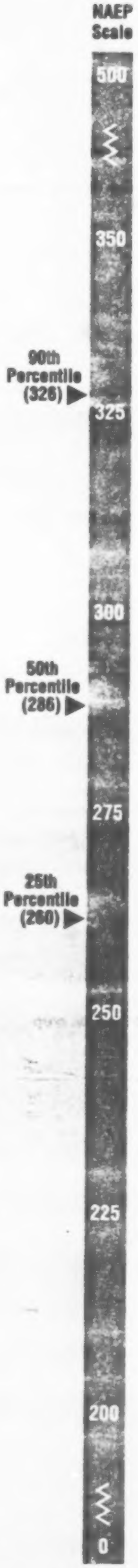
(360) Identify two reasons for changes in rural and urban populations represented on graph
(343) Explain historical reasons for language patterns represented on map
(333) Interpret graph and explain travel trends between the United States and Europe
(331) Explain reasons for international trade pattern represented on map
(325) Explain changes in the United States population centers represented on map
(306) Recognize reason for formation of OPEC
(295) Use map to evaluate expense of building rail route between two locations
(288) Explain why U.S. imports certain products
(282) Understand why countries join international organizations
(276) Recognize communications technology that enabled rapid spread of ideas
(275) Infer from map factors that can contribute to international conflicts over mineral resources
(263) Understand why immigrants congregate in New York City
(246) Recognize reason why skyscrapers are built in American cities

Figure 5.6 Map of Selected Items on the Geography Content Area Subscales for Grade 12

Each geography question was mapped onto the NAEP geography content area subscale on the basis of students' performance. The point on the subscale at which a question is positioned on the map represents the subscale score attained by students who had a 65-percent probability of successfully answering the question.

Thus, it can be said for each question and its corresponding subscale score that students with scores above that point on the subscale have a greater than 65-percent chance of successfully answering the question, while those below that point on the subscale have a less than 65-percent chance. (The probability was set at 74 percent for multiple-choice questions.)

The item map presented in this figure contains selected questions to illustrate the assessment. In interpreting the item map information, it should be kept in mind that students at different grades demonstrated these abilities with grade-appropriate materials.



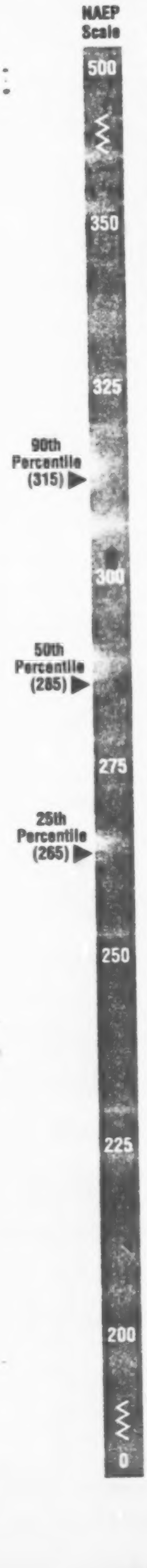
CONTENT AREA 1

Space and Place

(364) Infer cause of landscape formation from model
(358) Locate major physical features on outline map
(352) Explain origins of rock deposits found in specific region
(350) Use atlas data to draw graph of areas of continents and to create scale
(349) Draw cross-section graph of South America from written directions
(340) Use atlas to explain location pattern of Chinese industry
(326) Recognize major location of fjords
(317) Graph elevation of landform using contour map
(307) Infer trends in urban and rural population patterns from tabled data
(294) Identify highest point on contour map
(287) Compare map projections to determine which shows accurate shape and area of major landmasses
(280) Draw map without grid and create legend based on description of island
(277) Use two maps to determine North American regional vegetation
(272) Use atlas to compare climates of different regions
(264) Identify flat area using contour map
(249) Use atlas to identify physical barrier to European travel
(231) Use map to identify area of earthquake activity

NOTE: In this graphic illustration, the locations of scale points are necessarily approximate for questions clustered closely together.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.



CONTENT AREA 2

Environment and Society

(391) Interpret tabled data on hydrocarbons in atmosphere and explain pattern shown

(360) Choose professionals for U.N. committee on desertification and justify choices

(359) Analyze different perspectives on global warming shown in cartoon

(355) Explain causes of South American village climate based on description

(346) Explain differences between two countries' population densities

(332) Explain reasons for tropical deforestation

(321) Describe effect of Amazonian deforestation on North America

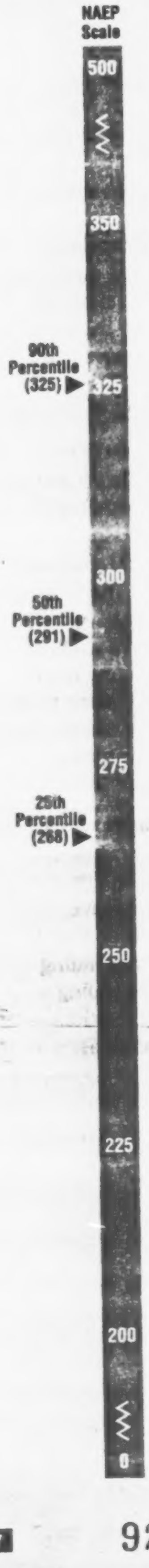
(308) Use contour map to explain formation of and what features of landform obstruct human settlement

(299) Recognize cause of greenhouse gases in atmosphere

(280) Identify natural boundaries of Chile

(277) Use atlas to identify pattern of land use in Ireland

(271) Discuss pro and con of locating cities by rivers



CONTENT AREA 3

Spatial Dynamics and Connections

(379) Use map to defend choice of site for town shopping center

(357) Use map to describe urban growth pattern

(349) Explain causes of migration to Mexico City

(345) Compare and explain data from two population pyramids

(323) Infer U.S. trade pattern from pie charts

(320) Understand impact of technology on suburban development

(314) Understand impact of slavery on Caribbean demographics

(310) Recognize economic characteristic of developing countries

(307) Interpret map to infer cause of African language pattern

(297) Infer characteristics of developed nation from statistical table

(291) Recognize regional characteristics

(276) Identify characteristic of urban business district

(270) Use graph to infer source of Hispanic migration to the United States

(258) Locate Spanish-speaking areas on world map

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Summary

Examining specific knowledge and skills demonstrated by students at various points on the geography composite scale reveals a variety of patterns in student performance. Generally, students across grades in the higher percentiles exhibited greater abilities to work with a range of geographic tools, create maps based on tabular or narrative data, grasp processes and relationships, bring outside knowledge to bear on answering questions, and analyze data. Perhaps predictably, these students were more likely to read more pages per day in school, spend more time on their homework, and more frequently discuss their studies at home than their lower performing peers. (See Endnote 1.)

When student performance on specific tasks is illustrated on item maps for each subscale, the percentiles for each subscale help to place these performances in perspective. Clearly, students found the assessment challenging. For each subscale across grades, a number of tasks fell at or above the 90th percentile. The NAEP 1994 geography assessment was rigorous; many tasks demanded the ability to analyze and interpret visual, tabular, and textual material. On the other hand (with some variation across grades and subscales), some tasks also fell at or just above the 50th percentiles, suggesting that half the student population was able to answer a reasonable portion of assessment questions.

Patterns of student subgroup performance on the three geography content areas for the most part reflected those shown on the composite scale. For example, across the three content areas, a positive relationship existed between increasing levels of parental education and student scores, and students attending nonpublic schools outperformed students attending public schools. In addition, with only a few exceptions, males outperformed females across content areas.

Endnotes

1. Results for pages read in school and time spent on homework are based on collapsed data. The data do not necessarily imply a direct, positive linear relationship between student performance on the NAEP geography assessment and students' reports of pages read in school and time spent on homework.

CONCLUSION

The NAEP 1994 geography assessment required students to analyze data in a variety of formats, explain complex geographic phenomena and processes, and show knowledge of relationships among human problems and events and geographic phenomena. A variety of stimuli, such as maps, photographs, tables, and charts, were used. In addition, a large percentage of assessment time was devoted to constructed-response questions, for which students had to write their own answers and create maps and tables.

Many students found the assessment difficult. For the nation as a whole, approximately one-quarter reached the *Proficient* achievement level, representing solid academic performance. Furthermore, when student performance on specific tasks is illustrated on item maps for each NAEP content area subscale, a number of tasks fell at and above the 90th percentiles for each subscale, indicating that only top-performing students could fully respond to these questions. On the other hand, approximately 70 percent of students were able to reach the *Basic* achievement level, which denotes partial mastery of knowledge and skills fundamental for proficient grade-level work. And (with some variation across grades and subscales), some tasks also fell near the 50th percentile on the subscale item maps, suggesting that half of the students sampled were able to answer a reasonable portion of assessment questions.

Some of the patterns in performance are characteristic of patterns seen in other NAEP assessments, such as reading and U.S. history. For example, White and Asian students generally had higher average scale scores than did Black and Hispanic students. In addition, students whose parents had higher levels of education outperformed their peers who reported lower levels of parental education, and students in nonpublic schools outperformed those in public schools. On the other hand, while male students outperformed female students only at grade 12 in the U.S. history assessment, male students outperformed female students at all grades in the NAEP 1994 geography assessment.

Subscale performances for geography generally mirrored performances on the composite scale, with some interesting variations. For example, at grade 4 males outperformed females on tasks assessing the geography content area *Space and Place,* while there were no significant performance differences in the other two content areas.

Performance associated with home support and other background variables also was consistent with that found in other NAEP assessments. Frequent television watching was associated with lower scale scores, while literacy materials in the home and discussing studies at home were associated with higher scale scores. It is encouraging that exposure to geography at grade 8 and to social studies at grade 4 were associated with higher average geography scores, and the more semesters of potentially geography-related course work done by twelfth graders, the better their performances.

While the NAEP results presented in this report cannot be used to draw causal inferences, they do point out interesting characteristics and patterns of student performance. Future research and other projects and analyses can use NAEP data to shed more light on relationships between performance and background data, which in turn can be used by policymakers, educators, and citizens to bring change to the United States educational system.

APPENDIX A

Overview of Procedures Used in the NAEP 1994 Geography Assessment

Introduction

The conduct of a large-scale assessment of educational progress entails the successful coordination of a multitude of projects, committees, procedures, and tasks. This appendix provides an overview of the NAEP 1994 geography assessment's primary components: framework, development, administration, scoring, and analysis. A more extensive review of procedures and methods used in the assessment will be included in a subsequent technical report: *The NAEP 1994 Technical Report*.

NAEP's Geography Assessment Framework

The framework underlying the NAEP 1994 geography assessment reflects current consensus among educators and researchers about the study of geography.

The framework's purpose was to provide a view of geography on which to base the NAEP assessment. Developing this framework and the specifications that guided development of the assessment involved the critical input of hundreds of individuals across the country, including representatives of national education organizations, teachers, parents, policymakers, business leaders, and the interested general public. This consensus process was managed by the Council of Chief State School Officers for the National Assessment Governing Board.

The framework sets forth a broad content matrix that describes geography in terms of content areas and cognitive dimensions. Figure A.1 illustrates this content matrix.

Figure A.1 NAEP 1994 Geography Assessment Framework Elements

Cognitive Dimension	Content Dimension		
	Space and Place	Environment and Society	Spatial Dynamics and Connections
Knowing	Where is the world's largest tropical rain forest?	What mineral resources are often extracted by strip mining?	What factors stimulate human migrations?
Understanding	Why are tropical rain forests located near the equator?	Explain the effects of strip mining and shaft mining on the landscape.	Explain the motivations of modern-day Mexicans and Cubans for immigrating to the United States.
Applying*	Support the conclusion that tropical rain forests promote wide species variation.	How can both economic and environmental interests be reconciled in an area of strip mining?	Compare current settlement and employment patterns of Cuban and Mexican immigrants in the United States.

Note: Example questions are illustrative only, and are not meant to represent the full array of assessment content.

* **Applying** refers to a range of higher-order thinking skills.

SOURCE: Geography Framework for the 1994 National Assessment of Educational Progress (1994), NAGB.

The assessment framework specified the aspects of geography to be measured and the percentage of assessment time that should be devoted to each. Table A.1 presents the target percentage distributions of content areas as specified in the framework, along with the actual percentage distributions in the assessment. The actual content of the assessment was consistent with the targeted distribution.

The Assessment Design

Each student in the assessment received an assessment booklet containing general background questions, geography questions, a set of background questions specific to social studies or geography, and a set of questions that determined students' motivation and familiarity with the assessment tasks. The geography questions and their stimulus material were arranged into blocks. Students were given either two 25-minute blocks or one 50-minute block. At the fourth grade, only 25-minute blocks were used.

The grade 4 assessment consisted of six 25-minute blocks, two of which were also administered to eighth-grade students. Each block contained single questions and sets, a variety of stimulus material, and a combination of multiple-choice and constructed-response questions. One or two of the constructed-response questions in each block required an extended response. A total of 59 multiple-choice questions, 23 short constructed-response questions, and 8 extended constructed-response questions were administered at grade 4.

The grade 8 assessment consisted of six 25-minute blocks and one 50-minute block. The six 25-minute blocks include two also administered at grade 4 (total of 31 questions) and two also administered at grade 12 (total of 34 questions). The 25-minute blocks followed the same pattern as those for grade 4. The 50-minute block included questions all focused on a particular theme and contained two extended constructed-response questions. A total of 84 multiple-choice questions, 32 short constructed-response questions, and 9 extended constructed-response questions were administered at grade 8.

The grade 12 assessment consisted of six 25-minute blocks (including two also administered at grade 8) and one 50-minute block. These blocks followed the same pattern as those for grades 4 and 8, except that all blocks (with the exception of one block for both grades 8 and 12 that included one extended constructed-response question) included two extended constructed-response questions. The 50-minute block included questions all focusing on a particular theme and contained two extended constructed-response questions. A total of 85 multiple-choice questions, 25 short constructed-response questions, and 13 extended constructed-response questions were administered at grade 12.

The assessment design allowed for maximum coverage of the domain of geography at each grade, while minimizing the time burden for any one student. This was accomplished through the use of matrix sampling, in which a representative sample of students took each portion of the assessment. Individual students were required to take only a small part; however, the aggregate results across the entire assessment allow for

TABLE A.1

Target and Actual Distribution of Assessment Time by Grade and Content Area
Grades 4, 8, and 12

Content Areas	Grade 4		Grade 8		Grade 12	
	Target	Actual	Target	Actual	Target	Actual
Space and Place	40%	42%	40%	39%	40%	42%
Environment and Society	30%	28%	30%	30%	30%	30%
Spatial Dynamics and Connections	30%	31%	30%	32%	30%	29%

Actual percentages do not sum to 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

broad reporting of geography abilities for the targeted population.

In addition to matrix sampling, the assessment design used a procedure for distributing booklets that controlled for position and balance effects. Students received different blocks of questions in their booklets according to a specific design. Balanced incomplete block (BIB) spiraling was used to assign blocks of questions in a manner that balanced the positioning of blocks across booklets and balanced the pairing of blocks within booklets. The spiraling aspect of this procedure cycles the booklets for administration so that typically only a few students in any assessment session receive the same booklet.

Teacher and School Questionnaires

One of the most important parts of NAEP's efforts to document the nature of students' achievement is the collection of contextual information regarding students' school experiences. As a part of the 1994 geography assessment, NAEP administered a questionnaire to teachers responsible for teaching social studies or geography to students who participated in the fourth- or eighth-grade assessments. In addition, the principals or other administrators of sampled schools at all grades were asked to complete a school questionnaire. These questionnaires were developed in consultation with an expert panel. These instruments focused on five areas: instructional content, instructional practices and experiences, teacher characteristics, school conditions and contexts, and conditions outside the school (i.e., home support, out-of-school activities, and attitudes).

The fourth- and eighth-grade social studies and geography teacher questionnaires were composed of two sections each. One section contained questions about teachers' background, education, and resources. The other section contained questions about teachers' recent exposure to training in various areas of geography education, the structure and nature of their classroom instruction, and the types of materials and approaches they use in teaching geography.

Because the sampling of teachers for the teacher questionnaires was based on participating students, the teachers' questionnaire responses do not necessarily represent all fourth- and eighth-grade teachers in the nation. Rather, they represent teachers of the representative sample of students in the assessment. Consequently, these findings portray the nature of students' instructional experiences and the background of their teachers.

It is important to note that in this report, as in all NAEP reports, the student is the unit of analysis — even when information from teacher or school questionnaires is being reported. Using the student as the unit of analysis makes it possible to link students' performance with their instructional and background experiences, thus providing a rich source of relevant information for educators and researchers. Although this approach may provide a different perspective from other studies that simply report information about teachers or schools, it is consistent with NAEP's goal of providing information about the educational context and performance of students.

Some students selected for the assessment were judged by school authorities to be incapable of meaningful participation in the assessment because they had limited English-language proficiency, were mentally challenged, or were functionally disabled. (See the *Limited English Proficient and Individualized Education Plan* section in this appendix.) For each student excluded from the assessment, schools were required to complete a questionnaire about the characteristics of that student and the reason for exclusion.

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NAEP Geography Samples

The results presented in this report are based on nationally representative probability samples of fourth-, eighth-, and twelfth-grade students. The samples were selected using a complex multistage sampling design involving the sampling of students from selected schools within selected geographic areas across the country. The sample design had the following stages:

1) selection of primary sampling units (PSUs) — geographic areas defined as counties or groups of counties);
2) selection of schools (both public and nonpublic) within the selected areas; and
3) selection of students within selected schools.

Each selected school that participated in the assessment, and each student assessed, represents a portion of the population of interest. To make valid inferences from the student samples to the respective populations from which they were drawn, sampling weights are needed. Sampling weights account for disproportionate representation due to oversampling of nonpublic schools and of students attending schools with high concentrations of Black or Hispanic students or both. Lower sampling rates for very small schools must also be accounted for with the sampling weights.

Table A.2 provides a summary of the weighted and unweighted student sample sizes for the geography assessment. The numbers reported include both public and nonpublic school students.

Unweighted and Weighted Sample Sizes by Grade and Region
Public and Nonpublic Schools
Grades 4, 8, and 12

	Unweighted Sample Size (and Percent of Total)		
	Grade 4	Grade 8	Grade 12
Nation	5,507 (100.0%)	6,878 (100.0%)	6,234 (100.0%)
Region			
Northeast	1,362 (24.7%)	1,289 (18.7%)	1,407 (22.6%)
Southeast	1,445 (26.2%)	2,075 (30.2%)	1,729 (27.7%)
Central	1,216 (22.1%)	1,444 (21.0%)	1,275 (20.5%)
West	1,484 (26.9%)	2,070 (30.1%)	1,823 (29.2%)

	Weighted Sample Size (and Percent of Total)		
	Grade 4	Grade 8	Grade 12
Nation	3,530,816 (100.0%)	3,447,145 (100.0%)	2,542,314 (100.0%)
Region			
Northeast	767,700 (21.8%)	694,286 (20.1%)	543,540 (21.4%)
Southeast	813,351 (23.0%)	865,529 (25.1%)	572,658 (22.5%)
Central	899,746 (25.5%)	830,366 (24.1%)	700,601 (27.6%)
West	1,050,018 (29.7%)	1,056,963 (30.7%)	725,515 (28.5%)

Percentages may not total 100 percent due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Limited English Proficiency (LEP) and Individualized Education Plan (IEP) Students

It is NAEP's intent to assess all selected students. Therefore, every effort is made to ensure that all selected students who are capable of participating in the assessment are assessed. However, some students sampled for participation in NAEP can be excused from the sample according to carefully defined criteria. Specifically, some students identified as having Limited English Proficiency (LEP) or having an Individualized Education Plan (IEP) may be incapable of participating meaningfully in the assessment. These students are identified as follows:

Students classified as LEP may be excluded from the assessment if

- the student is a native speaker of a language other than English; AND
- the student has been enrolled in an English-speaking school less than two years; AND
- the school staff most familiar with the student have judged the student to be incapable of taking part in the assessment.

Students classified as IEP may be excluded if

- the student is mainstreamed less than 50 percent of the time in academic subjects and is judged to be incapable of taking part in the assessment, OR
- the IEP team has determined that the student is incapable of taking part meaningfully in the assessment.

When there is doubt, the student is included in the assessment.

For each student excused from the assessment, school personnel complete a questionnaire about the characteristics of that student and the reason for exclusion.

Data Collection

The NAEP 1994 geography assessment was conducted from January through March 1994, with some make-up sessions in early April. As with all NAEP assessments, data collection for the 1994 assessment was conducted by trained field staff. For the geography assessment, this was accomplished by Westat, Inc., staff.

Scoring

Materials from the 1994 assessment were shipped to National Computer Systems in Iowa City for processing. Receipt and quality control were managed through a sophisticated bar-coding and tracking system. After all appropriate materials were received from a school, they were forwarded to the professional scoring area where the responses to the constructed-response questions were evaluated by trained staff using guidelines prepared by NAEP. Each constructed-response question had a unique scoring guide that defined the criteria to be used in evaluating students' responses. The extended-response questions were evaluated with four-level rubrics. Many of the short constructed-response questions were rated according to three-level rubrics that permitted partial credit to be given.

For the NAEP 1994 geography assessment, approximately 375,000 student responses were scored. This figure includes a 25-percent rescore to monitor interrater reliability. Comparable to the NAEP 1994 reading and U.S. history assessments, the overall percentages of agreement between scorers for the 1994 geography reliability samples were 93 percent at grade 4, 93 percent at grade 8, and 90 percent at grade 12.

Data Analysis and IRT Scaling

Subsequent to the professional scoring, all information was transcribed to the NAEP database at Educational Testing Service. Each processing activity was conducted with rigorous quality control. After the assessment information had been compiled in the database, the data were weighted according to the population structure. The weighting for the samples reflected the probability of selection for each student as a result of the sampling design, adjusted for nonresponse. Through stratification, the weighting ensured that the representation of certain subpopulations corresponded to figures from the U.S. Bureau of the Census and the Current Population Survey.[1]

Analyses were then conducted to determine the percentages of students who gave various responses to each geography and background question. In determining these percentages for the geography questions, a distinction was made between missing responses at the end of a block (i.e., missing responses subsequent to the last question the student answered) and missing responses prior to the last observed response. Missing responses before the last observed response were considered intentional omissions. Missing responses at the end of the block were considered "not reached" and treated as if the questions had not been presented to the student. In calculating response percentages for each question, only students classified as having been presented the question were included in the denominator of the statistic.

It is standard ETS practice to treat all nonrespondents to the last question in a block as if they had not reached the question. For multiple-choice and short constructed-response questions, this practice produces a reasonable pattern of results in that the proportion reaching the last question is not dramatically smaller than the proportion reaching the next-to-last question. However, for blocks that ended with extended constructed-response questions, the standard ETS practice would result in extremely large drops in the proportion of students attempting the final question. A drop of such magnitude seemed somewhat implausible. Therefore, for blocks ending with an extended constructed-response question, students who answered the next-to-last question but did not respond to the extended constructed-response question were classified as having intentionally omitted the last question.

Item response theory (IRT) was used to estimate average geography scale scores for the nation and for various subgroups of interest within the nation. IRT models the probability of answering a question in a certain way as a mathematical function of skill. The main purpose of IRT analysis is to provide a common scale on which performance can be compared across groups such as those defined by grades and characteristics, including race/ethnicity and gender.

Because of the BIB-spiraling design used by NAEP, students do not receive enough questions about a specific topic to provide reliable information about individual performance. Traditional test scores for individual students, even those based on IRT, would lead to misleading estimates of population characteristics, such as subgroup means and percentages of students at or above a certain achievement level. Consequently, NAEP constructs sets of plausible values designed to represent the distribution of scores in the population. A plausible value for an individual is not a scale score for that individual but may be regarded as a representative value from the distribution of potential scale scores for all students in the population with similar characteristics and identical patterns of item response. Statistics describing performance on the NAEP geography scale are based on the plausible values. They estimate values that would have been obtained had individual performances been observed — that is, had each student responded to a sufficient number of cognitive questions so that performance could be precisely estimated.[2]

For the NAEP 1994 geography assessment, within-grade scales were created to report performance for each subscale (i.e., content area). Similar scaling procedures were used to establish each of the three subscales. Specifically, three within-grade subscales (one for each grade) were established for each of the geography content areas. The within-grade subscales for grades 4 and 12 were then linked to the grade 8 subscale to form a common reporting metric. This common reporting metric, which runs from 0 to 500 for each of the subscales, was established so that the mean scores across all three grades is 250 and the standard deviation of the scores is 50.

The composite NAEP geography scale was produced as a weighted average of the subscales, the weights being given by the target percentages shown in Table A.1. The reporting metric of the composite scale, which also runs from 0 to 500, was again established so that the mean score across all three grades is 250. No constraints were imposed on the standard deviation of the cross-grade composite scores.

It may be helpful here to provide some guidance to the reader of this report about the types of cross-grade and cross-scale inferences that are appropriate. The use of a common cross-grade metric for the subscales and the composite scale was motivated primarily by issues of convenience in the reporting of results. In producing the subscales, IRT parameters for questions common across the grades were not constrained to be equal. As a result of this scaling convention, cross-grade comparisons of scale score averages, both at the subscale level as well as for the composite scale, may not be meaningful. Similarly, scale score differences (e.g., between subscale or composite scale averages for males and females) should probably not be compared across grades. The reader is best served by focusing on within-grade group comparisons and inferences.

The use of a common scaling procedure for each of the subscales does provide for some within-grade normative meanings across subscales. For example, at grade 4, a score of 200 is one cross-grade standard deviation unit below the cross-grade average for each of the geography subscales. Similarly, a score of 210 is four-fifths of a cross-grade standard deviation below the cross-grade average for each of the scales. A group, for example males, scoring 200 on the *Space and Place* subscale and 210 on the *Environment and Society* subscale did indeed perform "better" on the latter than on the former *in a cross-grade normative sense*. However, other inferences about relative performance in, say, a percent-correct metric do not necessarily follow. For example, a score of 200 on the *Space and Place* subscale may imply a higher expected percent-correct score on the collection of assessment exercises that define that scale than is implied by a score of 210 on the *Environment and Society* subscale. Thus, continuing with the current example, performance on the *Space and Place* subscale was better *in the percent-correct sense* than performance on the *Environment and Society* subscale.

In Chapter 5, performance across subscales is compared by examining patterns of subgroup differences (i.e., patterns of statistical significance between subgroups across the three subscales). These patterns are discussed separately for each of the three grades. Within-grade inferences based on such comparisons are defensible given the limited degree of comparability that exists in the subscale reporting metrics. As noted above, other types of inferences (e.g., inferences involving subscale score differences) may be less defensible.

The subscales summarize student performance across all three question types in the assessment (multiple-choice, short constructed-response, and extended constructed-response). In producing these subscales, two IRT models were used. Multiple-choice questions were scaled using the three-parameter logistic (3PL) model; and short constructed-response questions rated according to a three-level rubric, as well as extended constructed-response questions rated on a four-level rubric, were scaled using a generalized partial-credit (GPC) model.[3] Developed by ETS and first used in 1992, the GPC model permits the scaling of questions scored according to multipoint rating schemes. The model takes full advantage of the information available from each of the student response categories used for these more complex constructed-response questions.

The geography scale is composed of two types of questions: multiple-choice and constructed-response (scored according to a partial-credit model). One natural question about the scale concerns the amount of information contributed by each type of question. Unfortunately, this question has no simple answer for the NAEP geography assessment, due to the complex procedures used to form the composite geography scale.

The information provided by a given question is determined by the IRT model used to scale the question and is a function of proficiencies.[4] Thus, the answer to the query "How much information do the different types of questions provide?" will differ for each level of geography proficiency. When considering the composite geography scale, the answer is even more complicated. The geography data are scaled separately by the geography content areas. As discussed on the previous page, the composite scale is a weighted combination of these subscales. IRT information functions are only strictly comparable when they are linked on a common scale. Because the composite scale is based on three separate calibrations, without any common item linking, there is no direct way to compare the information provided by the questions on the composite scale.

NAEP Reporting Groups

Findings from the NAEP 1994 geography assessment are presented for groups of students defined by shared characteristics. Data are reported for subgroups only where sufficient numbers of students and adequate school representation are present. There must be at least 62 students in a particular subgroup, and these students must come from at least six different PSUs (see description of sampling design on page 84). Data for all students, regardless of whether their subgroup was reported separately, were included in computing overall national and regional results.

The reporting subgroups presented in this report include: region, race/ethnicity, gender, parents' highest level of education, type of school, and type of location. Definitions of these subgroups are provided on the following page.

Region. Results are reported for four regions of the nation: Northeast, Southeast, Central and West. States included in each region are shown in Figure A.2. All 50 states and the District of Columbia are listed. U.S. territories were not assigned to a region.

Race/Ethnicity. The race/ethnicity variable is an imputed definition of race/ethnicity, derived from up to three sources of information. This variable is used for race/ethnicity subgroup comparisons. Two questions from the student demographics questionnaire were used in the determination of derived race/ethnicity:

> If you are Hispanic, what is your Hispanic background?
>
> ○ I am not Hispanic.
>
> ○ Mexican, Mexican American, or Chicano
>
> ○ Puerto Rican
>
> ○ Cuban
>
> ○ Other Spanish or Hispanic background

Students who responded to this question by filling in the second, third, fourth, or fifth oval were considered Hispanic. For students who filled in the first oval, did not respond to the question, or provided information that was illegible or could not be classified, responses to the following question were examined in an effort to determine race/ethnicity.

> Which best describes you?
>
> ○ White (not Hispanic)
>
> ○ Black (not Hispanic)
>
> ○ Hispanic ("Hispanic" means someone who is Mexican, Mexican American, Chicano, Puerto Rican, Cuban, or other Spanish or Hispanic background.)
>
> ○ Asian ("Asian" means someone who is Chinese, Japanese, Korean, Vietnamese, or other Asian background.)
>
> ○ Pacific Islander ("Pacific Islander" means someone who is from a Filipino, Hawaiian, or other Pacific Island background.)
>
> ○ American Indian or Alaskan Native ("American Indian or Alaskan Native" means someone who is from one of the American Indian tribes, or one of the original people of Alaska.)
>
> ○ Other

Students' race/ethnicity was then assigned to correspond with their selection. For students who filled in the seventh oval ("Other"), provided illegible information or information that could not be classified, or did not respond at all, race/ethnicity as provided from school records was used.

Derived race/ethnicity could not be determined for students who did not respond to either of the demographic questions and for whom race/ethnicity was not provided by the school.

Figure A.2 States Included in the Four Regions

NORTHEAST	SOUTHEAST	CENTRAL	WEST
Connecticut	Alabama	Illinois	Alaska
Delaware	Arkansas	Indiana	Arizona
District of Columbia	Florida	Iowa	California
Maine	Georgia	Kansas	Colorado
Maryland	Kentucky	Michigan	Hawaii
Massachusetts	Louisiana	Minnesota	Idaho
New Hampshire	Mississippi	Missouri	Montana
New Jersey	North Carolina	Nebraska	Nevada
New York	South Carolina	North Dakota	New Mexico
Pennsylvania	Tennessee	Ohio	Oklahoma
Rhode Island	Virginia*	South Dakota	Oregon
Vermont	West Virginia	Wisconsin	Texas
Virginia*			Utah
			Washington
			Wyoming

*Note that the part of Virginia that is included in the Washington, DC, metropolitan area is included in the Northeast region; the remainder of the state is included in the Southeast region.

Gender. Results are reported separately for males and females.

Parents' Highest Level Education Level. The parents' education level variable is derived from responses to two questions in the student demographic questionnaire. Students were asked to indicate the extent of their mother's education (How far in school did your mother go?) by choosing one of the following:

- ○ She did not finish high school.
- ○ She graduated from high school.
- ○ She had some education after high school.
- ○ She graduated from college.
- ○ I don't know.

Students were asked to provide the same information about the extent of their father's education (How far in school did your father go?) by choosing one of the following:

- ○ He did not finish high school.
- ○ He graduated from high school.
- ○ He had some education after high school.
- ○ He graduated from college.
- ○ I don't know.

The information was combined into one parental education reporting category as follows: if a student indicated the extent of education for only one parent, that level was included in the data. If a student indicated the extent of education for both parents, the higher of the two levels was included in the data. For students who did not know the level of education for both parents or did not know the level of education for one parent and did not respond for the other, the parental education level was classified as unknown. If the student did not respond for both parents, the student was recorded as having provided no response.

It should be noted that approximately one-third of fourth graders and one-tenth of eighth graders reported not knowing the education level of either of their parents. The percentages of students who reported not knowing their parents' education level were larger for fourth-grade Hispanic students and for eighth-grade Black and Hispanic students compared to their White counterparts. (See Table A.3)

TABLE A.3

Percentage of Students Who Reported Not Knowing Their Parents' Highest Level of Education, by Race/Ethnicity
Grades 4, 8, and 12
1994 Geography Assessment

	Total	White	Black	Hispanic
Grade 4	34 (0.9)	33 (1.2)	36 (1.7)	41 (2.6)
Grade 8	10 (0.5)	7 (0.4)	14 (1.2)	18 (1.9)
Grade 12	3 (0.2)	1 (0.2)	5 (0.7)	8 (1.1)

The standard errors of the percentages appear in parentheses. It can be said with 95 percent certainty that for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

In addition, evidence from other surveys by the National Center for Education Statistics that gather data from students and parents indicates larger discrepancies between students' and parents' reports for Black and Hispanic students as compared to White students. These differences between racial/ethnic groups are most evident at grade 8. As shown in Table A.4, the correlations between students' and parents' reports of parental education were lower for Black and Hispanic students than for White students at both grades 8 and 12, although all correlations were higher in twelfth grade.

TABLE A.4

Correlations Between Students' and Parents' Reports of Parents' Education Level, by Race/Ethnicity
Grades 8 and 12

	White	Black	Hispanic
Grade 8			
Father's Education	0.84	0.67	0.75
Mother's Education	0.79	0.62	0.65
Grade 12			
Father's Education	0.90	0.80	0.85
Mother's Education	0.87	0.78	0.74

SOURCE: For grade 8 – P. Kaufman and R.A. Rasinski, *Quality of Responses of Eighth-Grade Students in NELS: 88*, Washington, DC: National Center for Education Statistics, NCES 91-487; For grade 12 – W. E. Fetters, P.S. Stowe, and J.A. Owings, *Quality of Responses of High School Students to Questionnaire Items*, Washington, DC: National Center for Education Statistics, NCES 84-342.

Type of School. Results are reported by the type of school that the student attends: public or nonpublic. Nonpublic schools include Catholic and other nonpublic schools. Bureau of Indian Affairs (BIA) schools and domestic Department of Defense (DoD) schools are not included in either the public or nonpublic categories but are included in the overall national results.

Type of Location. Results are reported for students attending schools in three mutually exclusive location types: central city, urban fringe/large town, and rural/small town:

Central City: This category includes central cities of all Standard Metropolitan Statistical Areas (SMSAs).[5] Central City is a geographic term and is not synonymous with "inner city."

Urban Fringe/Large Town: The urban fringe category includes all densely settled places and areas within SMSAs that are classified as urban by the U.S. Bureau of the Census. A Large Town is defined as a place outside a SMSA with a population greater than or equal to 25,000.

Rural/Small Town: Rural includes all places and areas with populations of less than 2,500 that are classified as rural by the U.S. Bureau of the Census. A Small Town is defined as a place outside a SMSA with a population of less than 25,000 but greater than or equal to 2,500.

As described earlier, the NAEP geography scale makes it possible to examine relationships between students' performance and a variety of background factors measured by NAEP. However, the fact that a relationship exists between achievement and another variable does not reveal the underlying cause of the relationship, which may be influenced by a number of other variables. Similarly, the assessment does not capture the influence of unmeasured variables. The results are most useful when they are considered in combination with other knowledge about the student population and the educational system, such as trends in instruction, changes in the school-age population, and societal demands and expectations.

Estimating Variability

Because the statistics presented in this report are estimates of group and subgroup performance based on samples of students, rather than the values that could be calculated if every student in the nation answered every question, it is important to account for the degree of uncertainty associated with the estimates. Two components of uncertainty are accounted for in the variability of statistics based on scale scores: 1) the uncertainty due to sampling only a relatively small number of students, and 2) the uncertainty due to sampling only a relatively small number of questions. The variability associated with the estimated percentages of students with certain background characteristics or who answered a certain cognitive question correctly is accounted for by the first component alone.

In addition to providing estimates of percentages of students and their average scores, this report provides information about the uncertainty of each statistic. Because NAEP uses complex sampling procedures, conventional formulas for estimating sampling variability that assume simple random sampling are inappropriate. NAEP uses a jackknife replication procedure to estimate standard errors. The jackknife standard error provides a reasonable measure of uncertainty for any information about students that can be observed without error. However, each student typically responds to so few questions within any content area that the score measurement for any single student would be imprecise. In this case, using plausible-values technology makes it possible to describe the performance of groups and subgroups of students, but the underlying imprecision that makes this step necessary adds an additional component of variability to statistics based on NAEP scale scores.[6]

The reader is reminded that, like findings from all surveys, NAEP results are also subject to other kinds of errors including the effects of imperfect adjustment for student and school nonresponse, and other unknowable effects associated with the particular instrumentation and data collection methods. Nonsampling errors can be attributed to a number of sources: inability to obtain complete information about all selected schools in the sample (some students or schools refused to participate, or students participated but answered only certain questions); ambiguous definitions; differences in interpreting questions; inability or unwillingness to give correct information; mistakes in recording, coding, or scoring data; and other errors of collecting, processing, sampling, and estimating missing data. The extent of nonsampling error is difficult to estimate. By their nature, the impact of such errors cannot be reflected in the data-based estimates of uncertainty provided in NAEP reports.

Drawing Inferences from the Results

The use of *confidence intervals*, based on the standard errors, provides a way to make inferences about the population means and percentages in a manner that reflects the uncertainty associated with the sample estimates.

An estimated sample mean ± 2 standard errors represents an approximate 95-percent confidence interval for the corresponding population quantity. This means that with approximately 95-percent certainty, the average scale score for the entire population of interest is within ± 2 standard errors of the sample mean.

As an example, suppose that the average score of students in a particular group was 256, with a standard error of 1.2. A 95-percent confidence interval for the population quantity would be as follows:

$$\text{Mean} \pm 2 \text{ standard errors}$$
$$256 \pm 2 \times 1.2$$
$$256 \pm 2.4$$
$$253.6,\ 258.4$$

Thus, one can conclude with 95-percent certainty that the average scale score for the entire population of students in that group is between 253.6 and 258.4.

Similar confidence intervals can be constructed for percentages, provided that the percentages are not extremely large (greater than 90) or extremely small (less than 10). For extreme percentages, confidence intervals constructed in the above manner may not be appropriate. However, procedures for obtaining accurate confidence intervals are quite complicated. Thus, comparisons involving extreme percentages should be interpreted with this in mind.

To determine whether there is a real difference between the mean score (or percentage of a certain attribute) for two groups in the population, one needs to obtain an estimate of the degree of uncertainty associated with the difference between the means or percentages of these groups for the sample. When comparing two independent estimates, this estimate of the degree of uncertainty — called the standard error of the difference between the groups — is obtained by taking the square of each group's standard error, summing these squared standard errors, and then taking the square root of this sum.

$$SE_{AB} = \sqrt{SE_A{}^2 + SE_B{}^2}$$

In a manner similar to that in which the standard error for an individual group mean or percentage is used, the standard error of the difference can be used t help determine whether differences between groups in the population are real. The difference between the mean scale score or percentage of the two groups ± 2 standard errors of the difference represents an approximate 95-percent confidence interval. If the resulting interval includes zero, there is insufficient evidence to claim a real difference between groups in the population. If the interval does not contain zero, th difference between groups is statistically significant (different) at the .05 level.

The procedures described in this section, and the certainty ascribed to intervals (e.g., a 95-percent confidence interval) are based on statistical theory that assumes that only one confidence interval or test of statistical significance is being performed. When one considers sets of confidence intervals, statistical theory indicates that the certainty associated with the entire s of intervals is less than that attributable to each individual comparison from the set. If one wants to hold the certainty level for a specific set of comparisons at a particular level (e.g., 95 percent), adjustments (called multiple-comparisons procedures) need to be made. A more complete discussion of the multiple-comparisons procedures is presented in the *NAEP 1994 Technical Report*.

The standard errors for means and percentages reported by NAEP are statistics and are subject to a certain degree of uncertainty. In certain cases, typically when the standard error is based on a small number of students (or when the group of students is enrolled in a small number of schools), the amount of uncertainty associated with the standard errors may be quite large. Throughout this report, estimates of standard errors subject to a large degree of uncertainty are designated by the symbol "!". In such cases, the standard errors — and any confidence intervals or significance tests involving these standard errors — should be interpreted cautiously.

Endnotes

1. For additional information about the use of weighting procedures in NAEP, see Johnson, E. G. (1989). "Considerations and techniques for the analysis of NAEP data." *Journal of Educational Statistics, 14(4),* 303-34.

2. For theoretical and empirical justification of the procedures employed, see Mislevy, R. J. (1988). "Randomization-based inferences about latent variables from complex samples." *Pyschometrika, 56(2),* 177-96.

   For computational details, see Mislevy, R. J. (1990). "Scaling procedures." In E.G. Johnson & R. Zwick, in collaboration with N. Allen, et al. *Focusing the new design: The NAEP 1988 Technical Report.* Princeton, NJ: National Assessment of Educational Progress, Educational Testing Service. See also Mislevy, R. J. (1992). "Scaling procedures." In E.G. Johnson & N. Allen, *The 1990 NAEP Technical Report.* Washington, DC: National Center for Education Statistics.

3. Muraki, E. (1992). "A generalized partial credit model: Application of an EM algorithm." *Applied Psychological Measurement, 16(2),* 159-76.

4. Donoghue, J. R. (1994). "An empirical examination of the IRT information of polytomously scored reading items under the generalized partial credit model." *Journal of Educational Measurement, 31(4),* 295-311.

   Muraki, E. (1993). "Information functions of the generalized partial credit model." *Applied Psychological Measurement, 17(4),* 351-63.

5. Standard Metropolitan Statistical Area (SMSA) as defined by the Office of Management and Budget.

6. For further details, see Johnson, E. G., & Rust, K. F. (1992). "Population inferences and variance estimation for NAEP data." *Journal of Educational Statistics, 17(2),* 175-90.

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APPENDIX B

Describing Students' Geography Performance

This appendix contains detailed information about the procedures used for describing students' geography knowledge and abilities and profiling students' study habits. Chapter 5 presents the results of these procedures.

Performance Descriptions Based on the Geography Composite Scale

A procedure known as scale anchoring was used to develop descriptions of student performance at selected points on the NAEP geography composite scale. The scale points selected for anchoring reflect three levels of geography knowledge and abilities corresponding to lower, middle, and higher performing students. These levels correspond to the 25th, 50th, and 90th percentile points on the composite scale as established by the performance of students in 1994 — the first assessment administered under NAEP's current geography framework.

Around each percentile point, a band was built to define a range of scale scores. Students described as being at a particular level were within a range of five percentile points on either side of the specified scale point. For example, the 50th percentile was defined as the region between the 45th and 55th percentile points on the scale. A question was identified as anchoring at a percentile point on the scale if at least 65 percent of the students within that percentile band answered the question successfully. (The criterion was set at 74 percent for multiple-choice questions to correct for the possibility of answering correctly by guessing.)

After defining the bands of the scale to be anchored, the next step in the process was to identify: (1) questions answered correctly for dichotomously scored questions and (2) questions answered at a particular score level for partial credit constructed-response questions. Because the extended constructed-response questions were scored according to four levels of performance, each extended constructed-response question was treated as three distinct questions corresponding to scores of "Partial or better," "Essential or better," and "Complet

These distinct score levels were then analyzed in the same manner as questions scored dichotomously, as either correct or incorrect. Thus, for example, an extended constructed-response question might anchor at the 50th percentile for "Partial or better" responses and at the 90th percentile for "Essential or better" responses.

A committee of geography education experts, including teachers for the grades involved, college professors, state curriculum supervisors, and researchers, was assembled to review the sets of questions identified for each percentile band. The committee was divided into three groups, one for each grade. Each group examined and analyzed questions that anchored at the 25th, 50th, and 90th percentiles to determine the specific geography knowledge and abilities associated with each question.

Committee members were also given the sets of questions at each grade that "did not anchor" to inform their decisions about what students could do by seeing examples of what they could not do. Drawing on their knowledge of geography, committee members were asked to summarize student performance by describing the knowledge, skills, and abilities demonstrated by students in each of the score bands.

The performance descriptions are cumulative (that is, the abilities described for the lower-performing students are considered to be among the abilities of students performing at higher points on the scale). Therefore, the full description of students' geography knowledge and abilities in the middle-scale band would include those abilities described at the lower band. Similarly, the abilities of students performing at the higher scale band include the geography abilities described for students at the middle and lower bands.

Profiling Students' Study Habits

Using the scale bands defined for the anchoring process described above, the profiling of students' study habits was accomplished by examining the responses of students within those bands to selected background questions. Tables B.1, B.2, and B.3 contain a complete presentation of students' responses to the three background questions highlighted in Chapter 5. The percentages that appear in the tables are conditional on the anchor scale point. That is, they are percentages of students who scored within a five percentile point range on either side of the specified scale point.

TABLE B.1

Responses of Students Near Selected Percentile Points to General Study Habit Questions
Grade 4

	25th Percentile Scale Range 170-187	50th Percentile Scale Range 206-216	90th Percentile Scale Range 249-26
Time Spent Each Day on Homework			
More Than 1 Hour	16 (2.1)	16 (2.0)	14 (3.1)
One Hour	28 (3.5)	31 (2.5)	33 (3.1)
One Half Hour or Less	39 (2.4)	37 (2.9)	37 (3.6)
Assigned/Don't Usually Do	5 (2.2)	4 (1.3)	1 (0.6)
Not Usually Assigned	13 (2.5)	13 (2.5)	14 (3.4)
Discuss Studies at Home			
Daily/Almost Daily	53 (3.6)	57 (3.4)	61 (3.6)
Once/Twice a Week	20 (3.6)	20 (2.8)	24 (2.6)
Once/Twice a Month	5 (1.3)	6 (1.7)	6 (2.1)
Never/Hardly Ever	22 (2.2)	17 (2.1)	9 (1.7)
Pages Read Each Day in School and for Homework			
More Than 20	21 (2.1)	21 (2.5)	24 (3.3)
16 to 20	13 (2.3)	14 (3.1)	19 (2.9)
11 to 15	13 (1.6)	15 (1.9)	19 (2.6)
6 to 10	23 (3.1)	25 (3.1)	25 (2.8)
5 or Fewer	30 (2.7)	25 (2.1)	13 (2.1)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

TABLE B.2

Responses of Students Near Selected Percentile Points to General Study Habit Questions
Grade 8

	25th Percentile Scale Range 230-243	50th Percentile Scale Range 258-267	90th Percentile Scale Range 295-312
Time Spent Each Day on Homework			
More Than 1 Hour	23 (2.4)	27 (2.6)	33 (2.7)
One Hour	35 (3.5)	38 (2.5)	37 (2.6)
One Half Hour or Less	23 (3.5)	22 (3.3)	21 (1.8)
Assigned/Don't Usually Do	10 (1.7)	7 (1.3)	4 (1.1)
Not Usually Assigned	9 (1.6)	7 (1.6)	5 (1.1)
Discuss Studies at Home			
Daily/Almost Daily	33 (3.0)	37 (3.9)	49 (2.8)
Once/Twice a Week	26 (3.4)	31 (2.9)	28 (3.4)
Once/Twice a Month	13 (2.2)	12 (2.4)	10 (1.7)
Never/Hardly Ever	28 (3.0)	20 (2.1)	13 (1.9)
Pages Read Each Day for School and Homework			
More Than 20	9 (1.9)	10 (2.3)	17 (2.4)
16 to 20	9 (1.4)	10 (2.3)	13 (2.1)
11 to 15	14 (2.0)	15 (2.2)	18 (2.0)
6 to 10	28 (2.3)	31 (2.5)	30 (2.2)
5 or Fewer	41 (3.1)	35 (2.8)	23 (2.7)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

TABLE B.3

Responses of Students Near Selected Percentile Points to General Study Habit Questions
Grade 12

	25th Percentile Scale Range 259-270	50th Percentile Scale Range 283-291	90th Percentile Scale Range 216-329
Time Spent Each Day on Homework			
More Than 1 Hour	22 (2.4)	24 (2.2)	38 (2.4)
One Hour	30 (2.9)	29 (2.7)	24 (2.6)
One Half Hour or Less	19 (1.6)	25 (2.3)	26 (2.6)
Assigned/Don't Usually Do	10 (1.6)	8 (1.3)	8 (1.5)
Not Usually Assigned	19 (3.1)	14 (1.9)	4 (1.3)
Discuss Studies at Home			
Daily/Almost Daily	27 (2.3)	30 (3.2)	38 (2.6)
Once/Twice a Week	28 (2.8)	29 (2.7)	36 (2.7)
Once/Twice a Month	15 (1.7)	16 (2.4)	11 (1.3)
Never/Hardly Ever	30 (3.2)	25 (2.2)	15 (2.4)
Pages Read Each Day for School and Homework			
More Than 20	9 (1.5)	13 (1.6)	26 (2.6)
16 to 20	8 (1.6)	12 (2.1)	15 (2.1)
11 to 15	12 (2.5)	16 (2.1)	16 (2.5)
6 to 10	27 (2.5)	23 (3.1)	19 (2.8)
5 or Fewer	44 (2.9)	37 (2.9)	23 (3.2)

Differences between the groups may be partially explained by other factors not included in this table.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Percentages of students in the subgroups may not total 100 due to rounding.

SOURCE: National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Geography Assessment.

Item-Mapping Procedures

To map questions to particular points on the NAEP geography subscales, a response probability convention had to be adopted that would divide those who had a higher probability of success from those who had a lower probability. Establishing a response probability convention has an impact on the mapping of assessment questions onto the geography subscales. A lower boundary convention maps the geography questions at lower points along the geography scales, and a higher boundary convention maps the same questions at higher points along the scales. The underlying distribution of geography skills in the population does not change, but the choice of a response probability convention does have an impact on the proportion of the student population that is reported as "able to do" the questions on the geography scales.

No point along the probability scale is clearly superior to any other point. If the convention were set with a boundary at 50 percent, those above the boundary would be more likely to get a question right than to get it wrong, while those below that boundary would be more likely to get the question wrong than right. While this convention has some intuitive appeal, it was rejected on the grounds that having a 50/50 chance of getting the question right shows an insufficient degree of mastery. If the convention were set with a boundary at 80 percent, students above the criterion would have a high probability of success with a question. However, many of the students below this criterion show some level of geography ability that such a stringent criterion would ignore. In particular, those in the range between 50 and 80 percent correct would be more likely to get the question right than wrong, yet would not be in the group described as "able to do" the question.

In a compromise between the 50-percent and the 80-percent conventions, NAEP has adopted two related response probability conventions: (1) 74 percent for multiple-choice questions (to correct for the possibility of answering correctly by guessing); and (2) 65 percent for constructed-response questions (where guessing is not a factor). These probability conventions were established, in part, based on an intuitive judgment that they would provide the best picture of students' geography knowledge and skills.

Some additional support for the dual conventions adopted by NAEP was provided by Huynh (1994).[1] He examined the IRT information provided by questions, according to the IRT model used in scaling NAEP questions. ("Information" is used here in a technical sense. See the *NAEP 1994 Technical Report* for details.) Following Bock (1972),[2] Huynh decomposed the item information into that provided by a correct response $[P(\theta) * I(\theta)]$ and that provided by an incorrect response $[(1-P(\theta)) * I(\theta)]$. Huynh showed that the item information provided by a correct response to a constructed-response question is maximized at the point along the geography scale at which two-thirds of the students get the question correct (for multiple-choice questions, information is maximized at the point at which 74 percent get the question correct). However, maximizing the *item* information $I(\theta)$, rather than the information provided by a *correct response* $[P(\theta) * I(\theta)]$, would imply an item mapping criterion closer to 50 percent.

Endnotes

1. Huynh, H. (1994, October). *Some technical aspects of standard setting.* Paper presented at the Joint Conference on Standard Setting for Large-Scale Assessment, Washington, DC.
2. Bock, R. D. (1972). "Estimating item parameters and latent ability when responses are scored in two or more latent categories." *Psychometrika, 37,* 29-51.

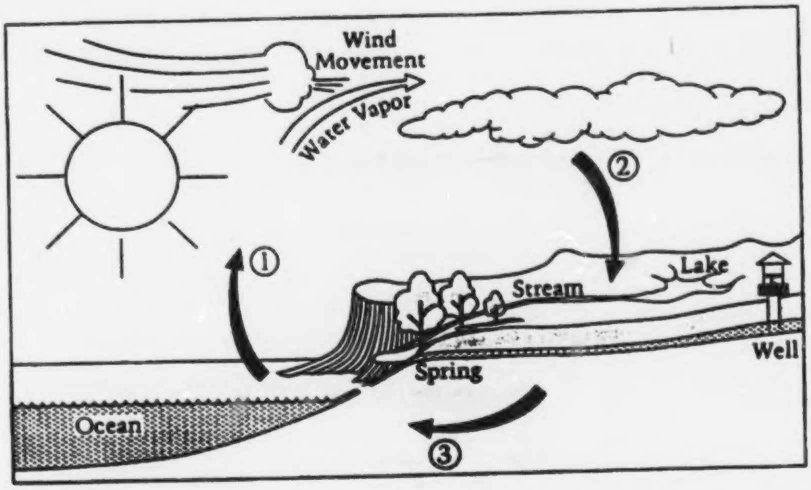
APPENDIX C

Sample Questions from the NAEP 1994 Geography Assessment

This appendix presents additional sample questions and student responses selected for each grade to exemplify the range of exercises included in the NAEP 1994 geography assessment. (A different set of sample questions and student responses are presented in Chapter 1, and entire sample blocks of questions can be found in the *NAEP 1994 Geography: A First Look* report, pages 27 to 67.) For each question, the geography content area being addressed is indicated.

For multiple-choice questions, the correct answer is marked (▶). For constructed-response questions, an abbreviated scoring rubic is provided. The sample student responses have been reproduced from assessment booklets and represent typical student performance.

The table accompanying each sample question presents two types of percentages: (1) the overall percentage of students within a grade who answered the question successfully and (2) the percentages of students within each of the achievement level intervals — *Basic, Proficient,* and *Advanced* — who answered the question successfully. For grades 4 and 12, the percentages for students within the *Advanced* achievement lev interval are not presented, however, because of the sma sample sizes. The table also includes the percentages o students below *Basic* who successfully answered the questions. (Sample size criteria for reporting results ar described in Appendix A.)



What would be the best title for this picture?

A The Tides

▶B The Water Cycle

C The Seasons

D Ocean Currents

Geography Content Area: Environment and Society

Grade 4	**Percentage Correct Within Achievement Level Intervals**			
Overall Percentage Correct	***Below Basic*** **186 and below***	***Basic*** **187-239***	***Proficient*** **240-275***	***Advanced*** **276 and above***
79 (1.4)	**52 (3.0)**	**86 (1.7)**	**98 (1.4)**	*****

*NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate (see Appendix A). The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Describe two important effects that a major oil spill in an ocean can have on the environment or on people's lives.

Geography Content Area: Environment and Society

Grade 4 **Overall Percentage Complete**	**Percentage Correct Within Achievement Level Intervals**			
	Below Basic **186 and below***	***Basic*** **187-239***	***Proficient*** **240-275***	***Advanced*** **276 and above***
13 (1.0)	3 (1.4)	12 (1.7)	28 (3.3)	***

*NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate.
The standard errors of the estimated percentages appear in parentheses. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Sample Response (Score of 3):

Describe two important effects that a major oil spill in an ocean can have on the environment or on people's lives.

Oil can kill animals It is hard to clean up and then you cannot swim in the ocean.

A **Complete** response (score of 3) describes two effects of an oil spill in a distant place. Effects described may be environmental (for example, pollutes beaches, pollutes air, kills living organisms), economic (for example, ruins fishing industry, ruins tourist industry), or political (for example, causes disputes over who is responsible for cleanup).

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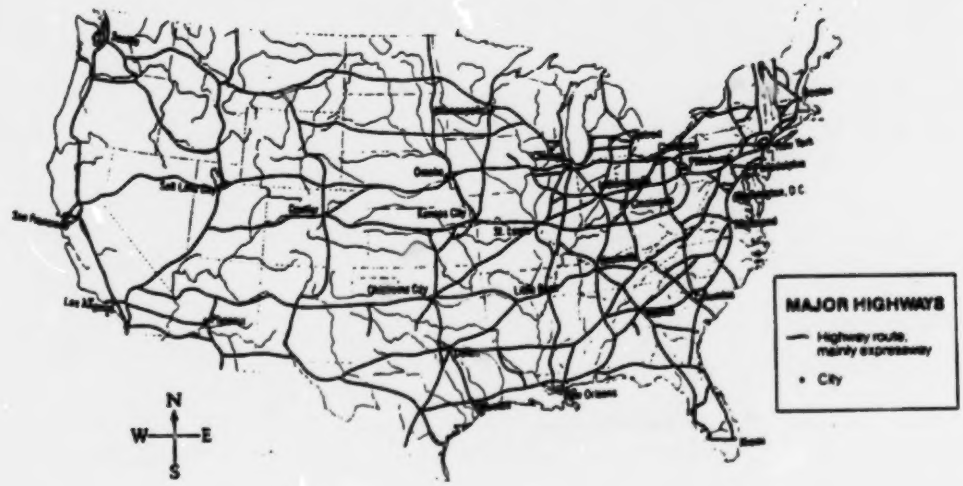


The map shows that one part of the country has more major highways than the other part of the country. Why is this?

- ▶A There are more people and cities in the eastern part of the country.
- B It is easier to build highways in the eastern part of the country.
- C Cars are not an important form of transportation in the western part of the country.
- D States are larger in the western part of the country.

Geography Content Area: Spatial Dynamics and Connections

Grade 4	Percentage Correct Within Achievement Level Intervals			
Overall Percentage Correct	*Below Basic* 186 and below*	*Basic* 187-239*	*Proficient* 240-275*	*Advanced* 276 and above*
59 (1.5)	41 (3.0)	62 (1.9)	77 (3.0)	***

*NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate (see Appendix A).
The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

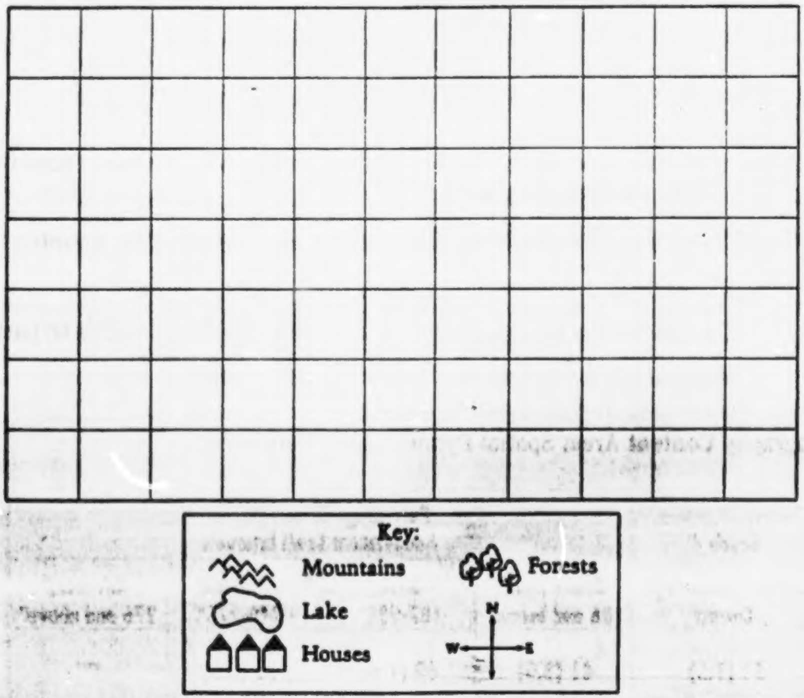
1) In the box below, draw a map of an island.

2) On the island, put in the following details:

- Mountains along the west coast
- A lake in the north
- Houses along the east coast
- Forests in the south

Be sure to use the symbols shown in the key below.

Use your colored pencils to help you draw the map.



Geography Content Area: Space and Place

Grade 4	**Percentage "Essential" or "Complete" Within Achievement Level Intervals**			
Overall Percentage Essential or Complete	***Below Basic*** **186 and below***	***Basic*** **187-239***	***Proficient*** **240-275***	***Advanced*** **276 and above***
70 (1.5)	**37 (3.0)**	**76 (2.0)**	**93 (2.1)**	*****

*NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate (see Appendix A).
The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

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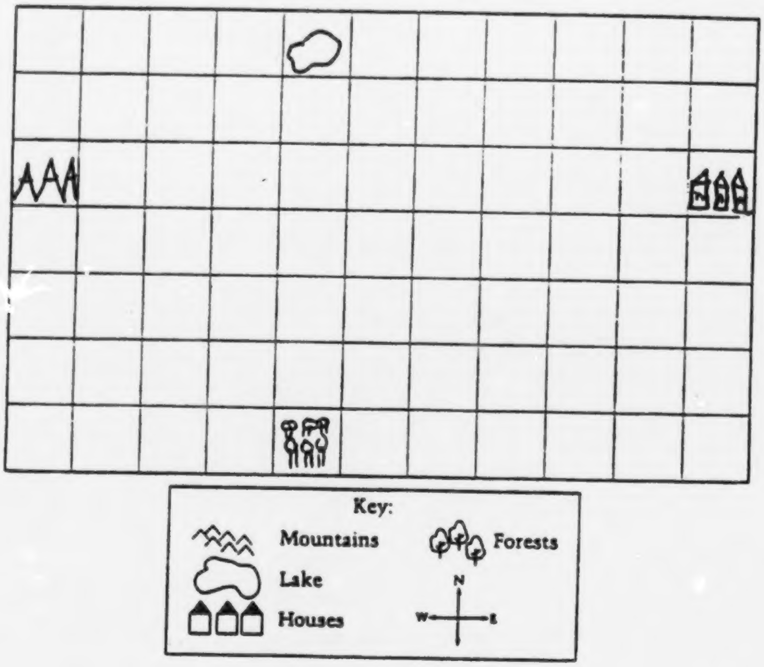
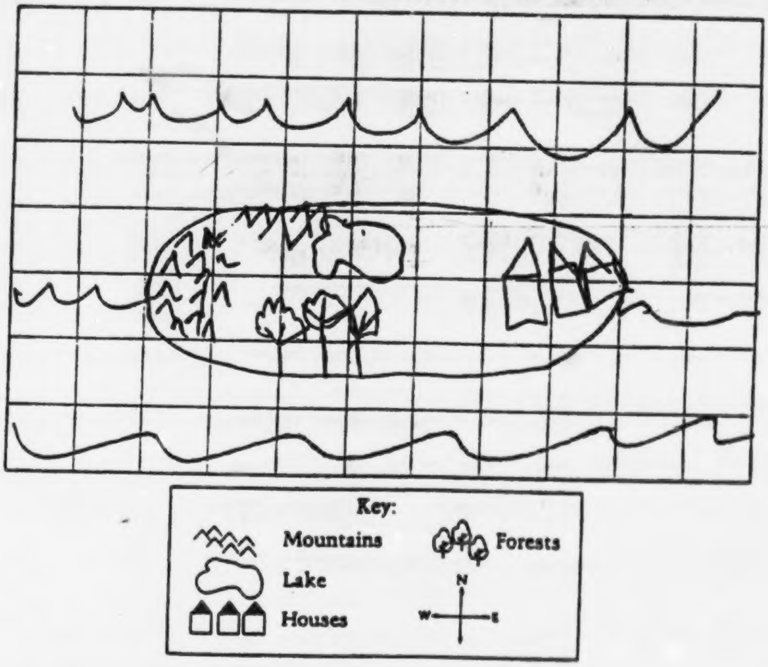
Sample Response (Score of 3):


Key:
Mountains
Forests
Lake
N
Houses
W
E

An **Essential** response (score of 3) correctly indicates three or four of the elements.

Sample Response (Score of 4):


Key:
Mountains
Forests
Lake
N
Houses
W
E

A **Complete** response (score of 4) correctly indicates all the elements.

If you wanted to find out which page in the atlas had a map that showed the city of Dakar, where would you look?

- A The World Map Projections pages
- ▶B The Index
- C The World Facts page
- D The Earth Notes page

Geography Content Area: Space and Place

Grade 8 Overall Percentage Correct	Percentage Correct Within Achievement Level Intervals			
	Below Basic 241 and below*	*Basic* 242-281*	*Proficient* 282-314*	*Advanced* 315 and above*
90 (0.7)	78 (2.1)	95 (1.0)	97 (1.2)	***

*NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate (see Appendix A). The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

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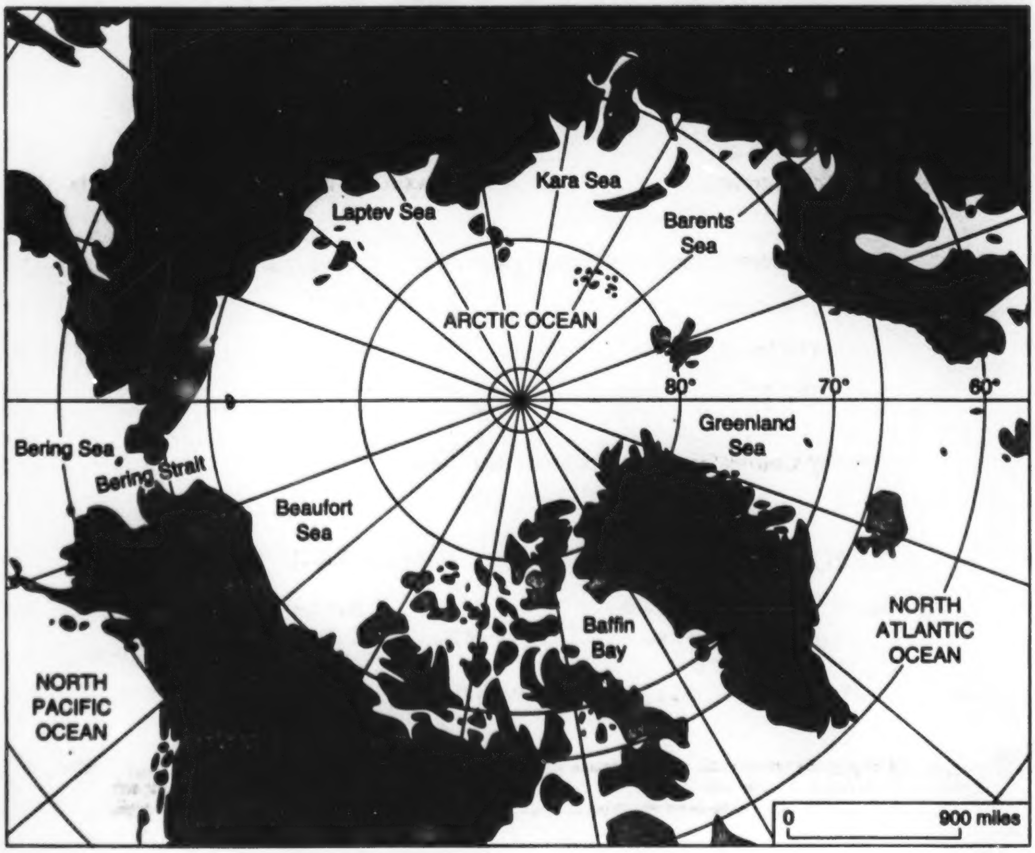
Kara Sea
Laptev Sea
Barents Sea
ARCTIC OCEAN
80°
70°
60°
Greenland Sea
Bering Sea
Bering Strait
Beaufort Sea
Baffin Bay
NORTH ATLANTIC OCEAN
NORTH PACIFIC OCEAN
0
900 miles

Latitude on this map is represented by

- ▶A circles
- B shaded areas
- C straight lines
- D convergent lines

Geography Content Area: Space and Place

Grade 8	**Percentage Correct Within Achievement Level Intervals**			
Overall Percentage Correct	***Below Basic*** **241 and below***	***Basic*** **242-281***	***Proficient*** **282-314***	***Advanced*** **315 and above***
48 (1.4)	35 (2.7)	44 (2.0)	65 (2.7)	***

***NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate (see Appendix A).**
The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

People from many different countries live in New York City. Children speaking many different languages attend its public schools. This is mainly because New York City

A has an efficient transportation system

B has a higher wage rate than other United States cities

▶C is a port of entry for people from other parts of the world

D is the site of the United Nations headquarters

Geography Content Area: Spacial Dynamics and Connections

Grade 8 **Overall Percentage Correct**	**Percentage Correct Within Achievement Level Intervals**			
	Below Basic 241 and below*	*Basic* 242-281*	*Proficient* 282-314*	*Advanced* 315 and above*
70 (1.4)	46 (2.6)	74 (2.9)	87 (3.2)	99 (1.4)

*NAEP geography composite scale range.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

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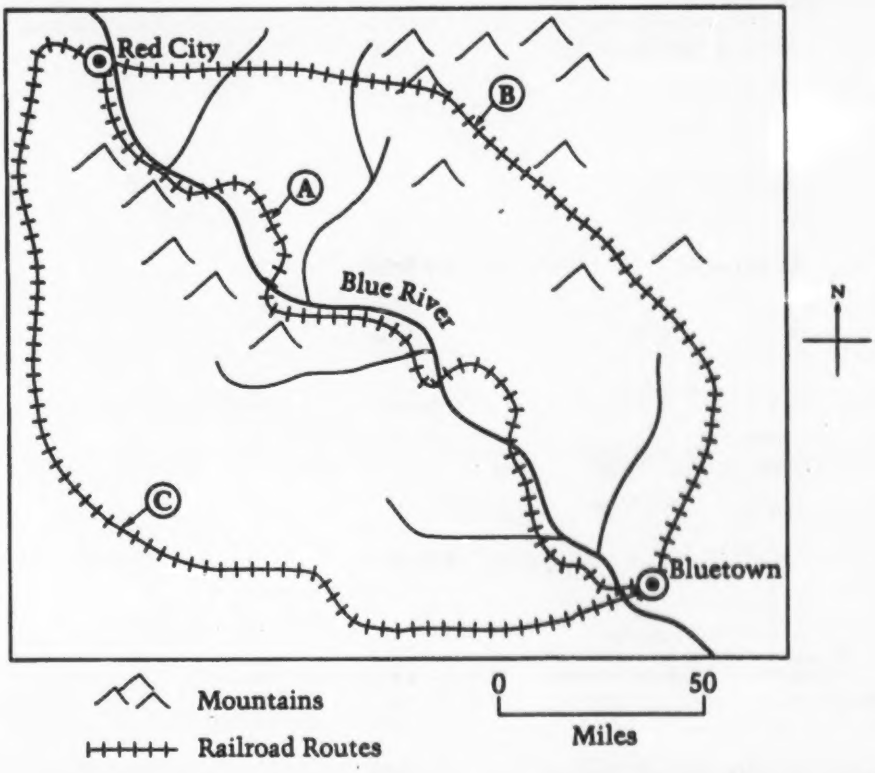

Look at the map above, which shows three possible routes for a railroad line that will be built to connect Red City with Bluetown.

Which route would be the least expensive to construct?

____

Give two reasons why the route you chose would be the least expensive.

1 ______________________________

2 ______________________________

Geography Content Area: Spacial Dynamics and Connections

Grade 8	**Percentage "Complete" Within Achievement Level Intervals**			
Overall Percentage Complete	***Below Basic*** **241 and below***	***Basic*** **242-281***	***Proficient*** **282-314***	***Advanced*** **315 and above***
36 (1.5)	**10 (1.6)**	**36 (2.3)**	**62 (3.3)**	**80 (7.9)**

***NAEP geography composite scale range.**
The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Sample Response (Score of 3):

Look at the map above, which shows three possible routes for a railroad line that will be built to connect Red City with Bluetown.

Which route would be the least expensive to construct?

C.

Give two reasons why the route you chose would be the least expensive.

1. Route A would have to be a bridge to go over the river.

2. Route B would be going over mountains.

A **Complete** response (score of 3) indicates that C is the least expensive route to construct. It gives two reasons why that may relate to A and B.

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After we anchored our ships in the ocean and went ashore to explore, we marched west. The forest was so thick we could only travel three miles in the first two days. Then we came to the mountains and climbed to the top. A rushing river flowed west out of the mountains. We continued to march two miles west and came down out of the mountains. Two miles further we came to the coast. It was obvious that the area we were exploring was an isthmus.

In the box below, draw a map of the region described above. Be sure to include all of the geographical elements mentioned in the description. Include a scale to indicate distances.

Geography Content Area: Space and Place

Grade 8	Percentage "Essential" or "Complete" Within Achievement Level Intervals			
Overall Percentage Essential or Complete	*Below Basic* 241 and below*	*Basic* 242-281*	*Proficient* 282-314*	*Advanced* 315 and above*
41 (1.3)	9 (2.0)	39 (2.4)	78 (3.4)	92 (4.8)

*NAEP geography composite scale range.

The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

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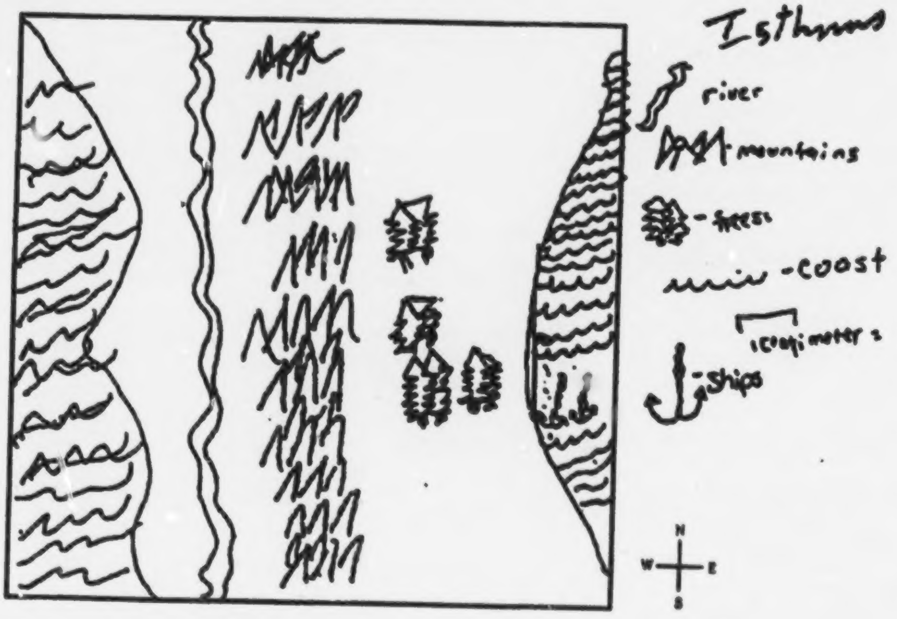
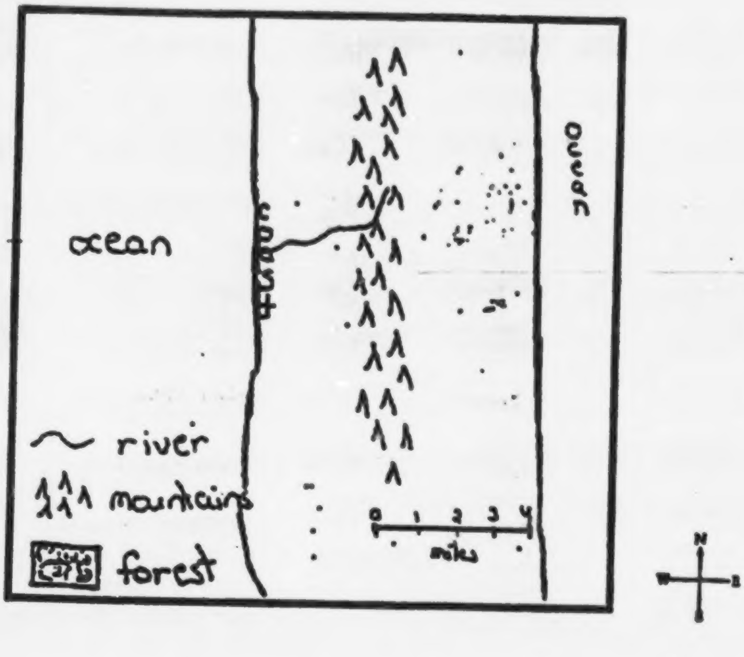
Sample Response (Score of 3):

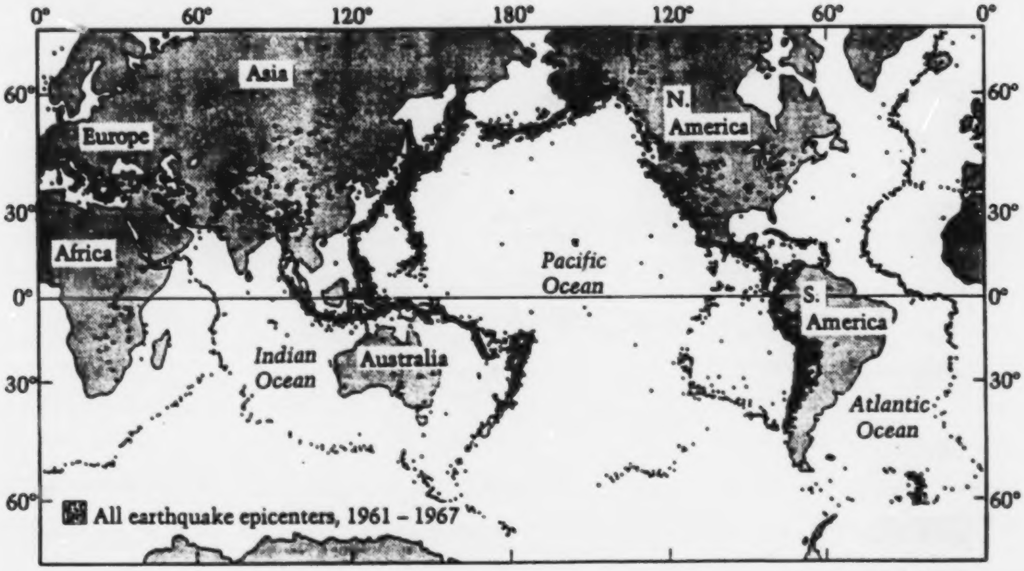

Isthmus
river
mountains
trees
coast
1 centimeter =
Ships
N
W
E
S

An **Essential** response (score of 3) includes a map in which three elements are correctly placed. The response may be a peninsula or an island.

Sample Response (Score of 4):


ocean
ocean
river
mountains
forest
0 1 2 3 4
miles
N
W
E

A Complete response (score of 4) includes an accurate map in which at least four elements are correctly placed. The response must be an isthmus and have direction of travel and river correctly indicated.


0°
60°
120°
180°
120°
60°
0°
60°
30°
0°
30°
60°
Asia
Europe
Africa
N. America
S. America
Australia
Pacific Ocean
Indian Ocean
Atlantic Ocean

▨ All earthquake epicenters, 1961 – 1967

Between 1961 and 1967, the area that had the most earthquakes was the

A Mediterranean basin

B mid-Atlantic Ocean

C Caribbean Sea

▶D Pacific Ocean rim

Geography Content Area: Space and Place

Grade 12	**Percentage Correct Within Achievement Level Intervals**			
Overall Percentage Correct	***Below Basic*** **269 and below***	***Basic*** **270-304***	***Proficient*** **305-338***	***Advanced*** **339 and above***
91 (0.9)	**78 (2.7)**	**95 (1.0)**	**99 (0.5)**	*******

***NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate (see Appendix A).**
The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

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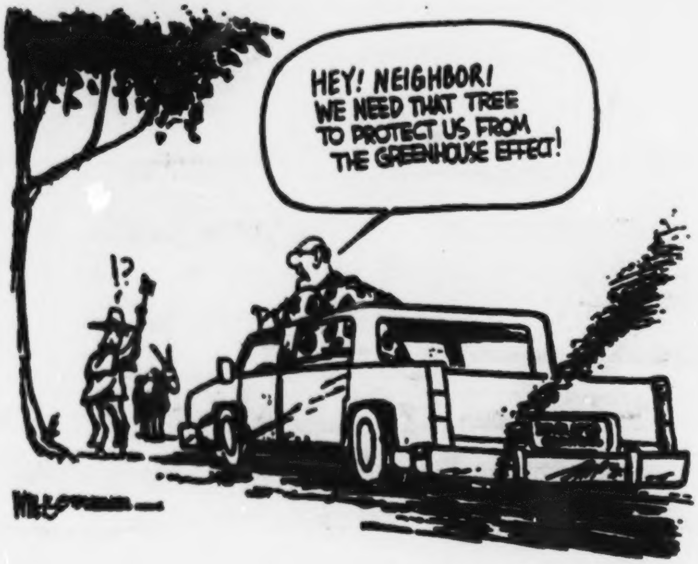
HEY! NEIGHBOR! WE NEED THAT TREE TO PROTECT US FROM THE GREENHOUSE EFFECT!
!?

Bas/Rothco

Environmental issues are viewed differently by people in different circumstances. Explain how the artist makes this point in the cartoon.

Geography Content Area: Environment and Society

Grade 12	**Percentage "Essential" or "Complete" Within Achievement Level Intervals**			
Overall Percentage Essential or Complete	***Below Basic*** **269 and below***	***Basic*** **270-304***	***Proficient*** **305-338***	***Advanced*** **339 and above***
40 (1.7)	**7 (1.6)**	**40 (2.4)**	**71 (3.6)**	*****

*NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate (see Appendix A).
The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

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Sample Response (Score of 3):

Environmental issues are viewed differently by people in different circumstances. Explain how the artist makes this point in the cartoon.

The man chopping the tree is riding a mule. The man telling the other man not to chop down the tree is in an automobil and is causing pollution. In a way they are both hurting the ozone.

A **Complete** response (score of 3) mentions two different views (developed versus developing) and refers to trees and car pollution. An appreciation of tension may or may not be present. Or, the response implies or states the hypocrisy that exists and talks about the tree or the car.

Sample Response (Score of 4):

Environmental issues are viewed differently by people in different circumstances. Explain how the artist makes this point in the cartoon.

The artist says that developed countries are condening underdeveloped countries for cutting down tree because it adds to the green house effect. But the developed countries are driving cars and polluting the atmosphere. The artists are saying the developed countries are hipocrits.

An **Essential** response (score of 4) discusses the environmental issues, tension (implied or stated between the two worlds), hypocrisy (not absolutely necessary if tension is clearly discussed), and two different viewpoints (developed versus developing). The discussion must be at the national level.

Which of the following countries has the largest volume and value of trade with the United States?

- A Japan
- B Great Britain
- ▶C Canada
- D Germany

Geography Content Area: Spacial Dynamics and Connections

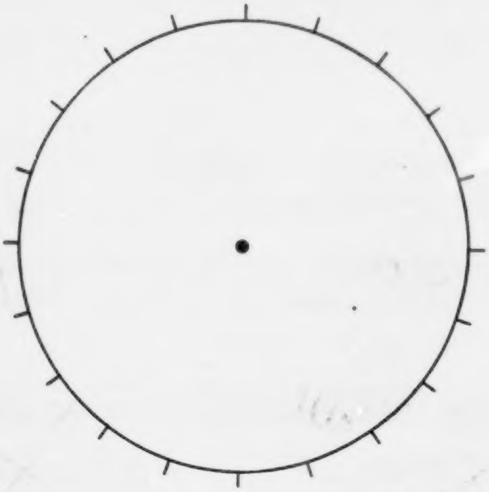
Grade 12	**Percentage Correct Within Achievement Level Intervals**			
Overall Percentage Correct	***Below Basic*** **269 and below***	***Basic*** **270-304***	***Proficient*** **305-338***	***Advanced*** **339 and above***
10 (1.0)	**11 (1.7)**	**9 (1.6)**	**9 (2.3)**	*******

***NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate (see Appendix A).**
The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

AVERAGE ANNUAL PRECIPITATION FOR LAKESIDE

Season	Average Inches	Percent of Total
Spring	5.0	25
Summer	7.0	35
Fall	4.0	20
Winter	4.0	20
Total	20.0	100

Use the information in the table above to construct a pie chart on the figure below. Be sure to label all information. You may use your ruler to draw the chart.



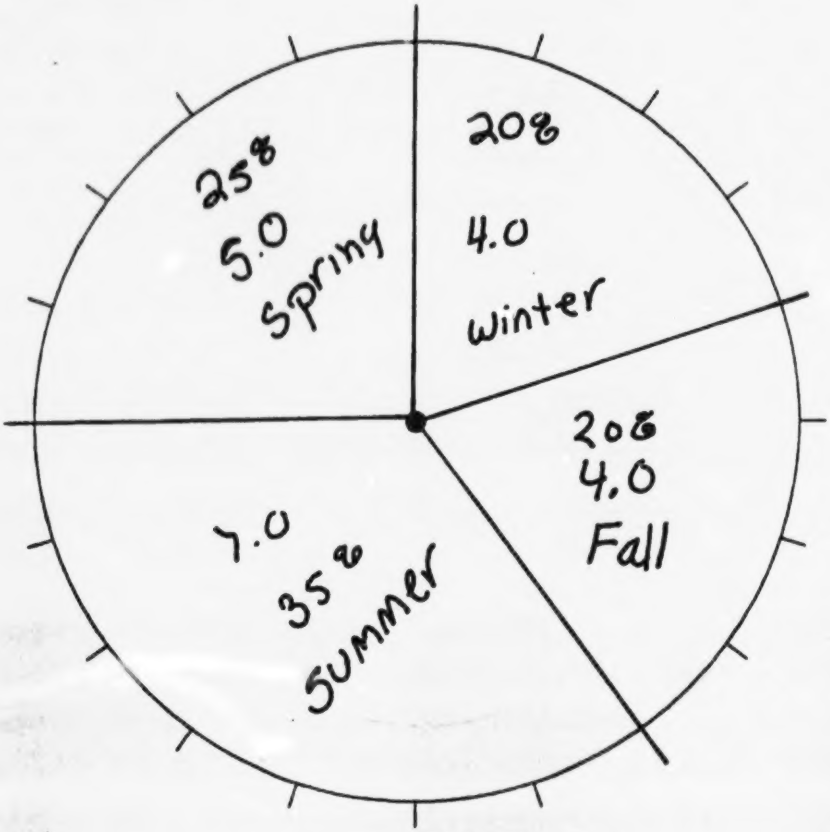
Geography Content Area: Space and Place

Grade 12	Percentage Correct Within Achievement Level Intervals			
Overall Percentage Correct	*Below Basic* 269 and below*	*Basic* 270-304*	*Proficient* 305-338*	*Advanced* 339 and above*
66 (1.6)	32 (2.9)	69 (2.0)	89 (1.9)	***

*NAEP geography composite scale range. *** Sample size insufficient to permit a reliable estimate (see Appendix A).
The standard errors of the estimated percentages appear in parenthesis. It can be said with 95-percent certainty that, for each population of interest, the value for the whole population is within plus or minus two standard errors of the estimate for the sample.

Sample Response (Score of 3):

Use the information in the table above to construct a pie chart on the figure below. Be sure to label all information. You may use your ruler to draw the chart.



A **Complete** response (score of 3) correctly charts the percentage of rainfall of the four seasons on the circle and correctly labels the segments (the minimum correct labels are the four seasons).

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The NAEP 1994 geography assessment was a collaborative effort among staff from the National Center for Education Statistics (NCES), the National Assessment Governing Board (NAGB), Educational Testing Service (ETS), Westat, and National Computer Systems (NCS). The program benefited from the contributions of hundreds of individuals at the state and local levels — governors, chief state school officers, state and district test directors, state coordinators, and district administrators — who tirelessly provided their wisdom, experience, and hard work. Most importantly, NAEP is grateful to students and school staff who made the assessment possible.

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The NAEP project at ETS is directed by Paul Williams and resides in the Center for the Assessment of Educational Progress (CAEP), managed by Archie Lapointe and Paul Williams. Steve Lazer managed test development activities, and Hilary Persky worked with the Geography Item Development committee to develop the assessment instruments. Jules Goodison managed the operational aspects together with John Olson, and sampling and data collection activities were carried out by Westat under the direction of Rene Slobasky, Nancy Caldwell, and Keith Rust. Printing, distribution, scoring, and processing activities were conducted by NCS, under the supervision of Judy Moyer, Brad Thayer, Mathilde Kennel, Linda Reynolds, and Barbara Price.

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